UCRL-53798

Bikini Atoll Ionizing Radiation Survey May 1985 – May 1986

K.L. Shingleton, J.L. Cate, M.G. Trent, W.L. Robison

October 1, 1987

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Addendum

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Abstract

The survey was designed to measure the beta dose rate from ^{137}Cs and $^{90}Sr/^{90}Y$ relative to previously measured gamma dose rates on Bikini and Eneu Islands. We exposed modified Panasonic-802 thermoluminescent dosimeters (TLDs) in over 100 sites for six months to accomplish this task. The sites were selected to be either in areas of known high gamma dose rates, in areas where the Marshallese would likely spend most of their time upon resettlement, or in areas where experimental environmental changes had been made. Therefore, the beta and gamma dose rates *do not* represent island averages.

The mean beta dose rate on Eneu ranged from 23 mrem/yr at 1 cm to 6 mrem/yr at 100 cm, as compared with a mean deep dose rate of 17.5 mrem/yr. The mean beta dose rate around houses and in general areas on Bikini ranged from 425 mrem/yr at 1 cm to 178 mrem/yr at 100 cm, compared with a deep dose rate of about 154 mrem/yr.

Because monitoring sites were specifically placed in the most contaminated areas of Bikini and Eneu, the unshielded beta dose rates reported provide an upper limit of radiation dose; actual doses received by the Bikinians would be reduced significantly by clothing, footwear, and groundcover such as crushed coral, which reduces the beta dose rate by 80–90%. The amount of time spent in houses and in the minimally contaminated areas around houses and the lagoon would further reduce the beta dose rates reported here.

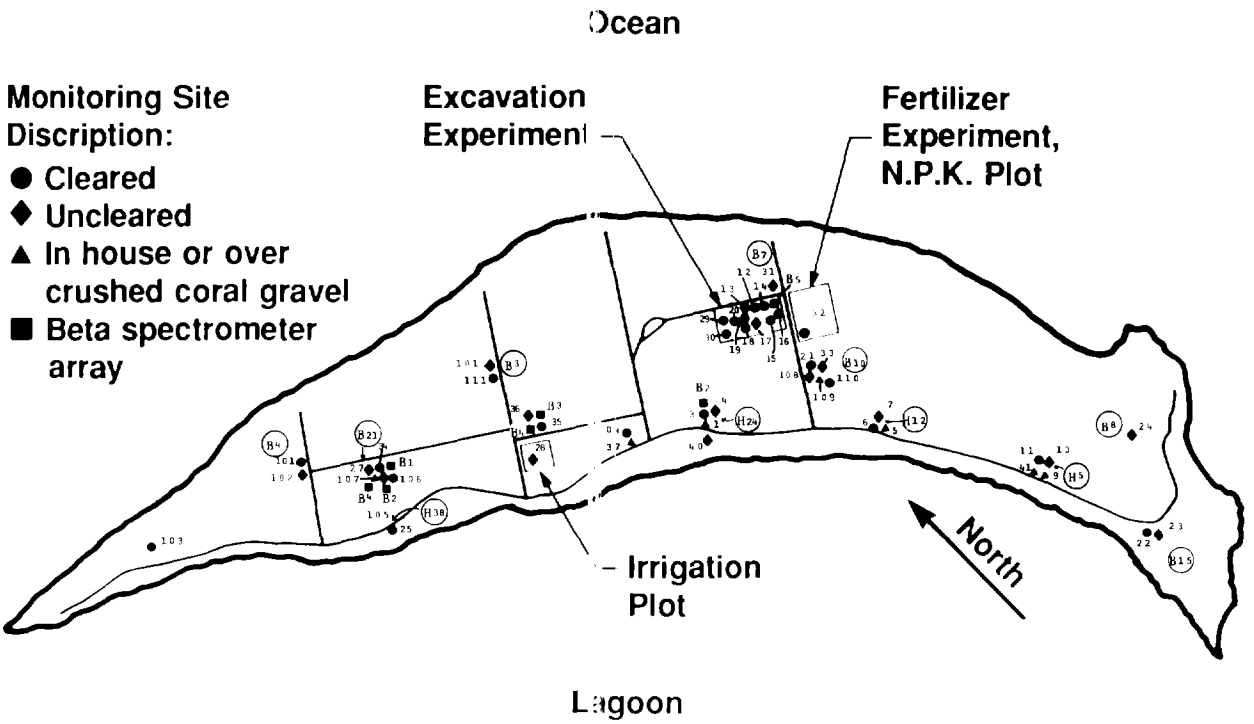


Figure 1. Distribution of monitoring stations on Bikini Island.

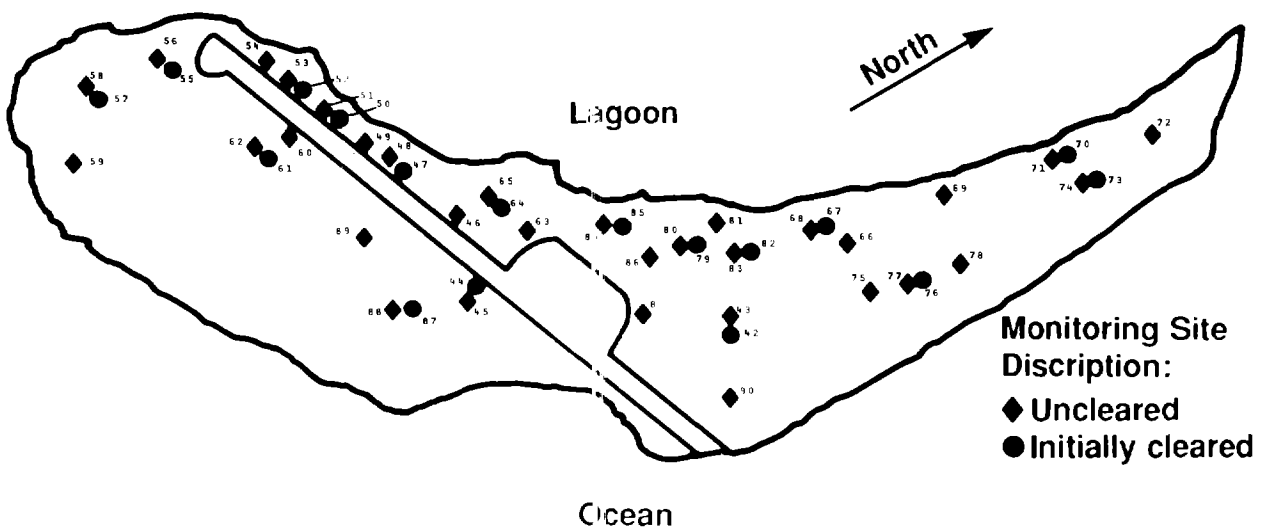
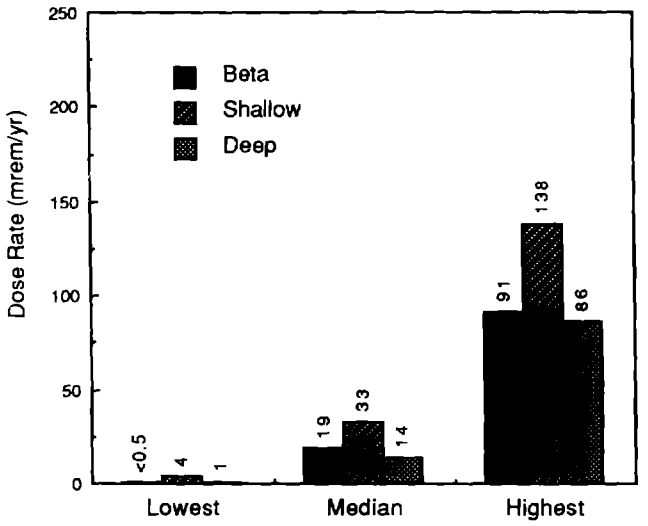
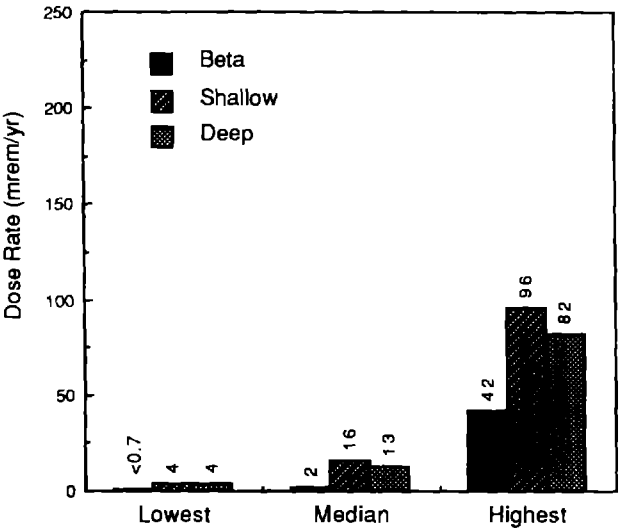
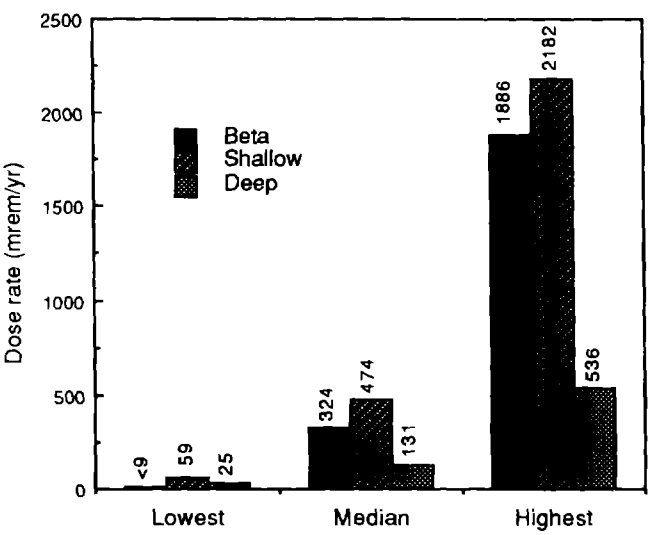


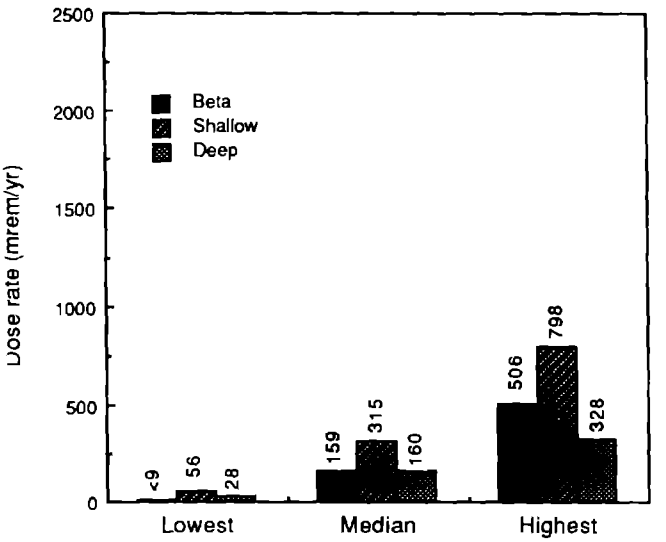
Figure 2. Distribution of monitoring stations on Eneu Island.



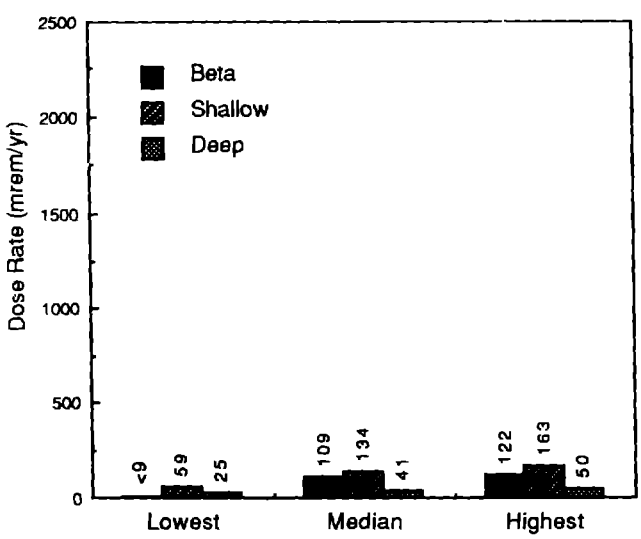


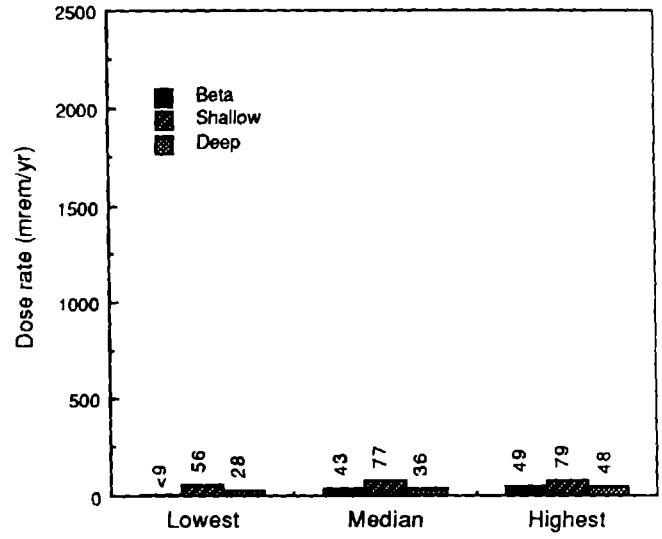
Dose rates on Eneu at 1 cm (left) and 100 cm (right) from ground.



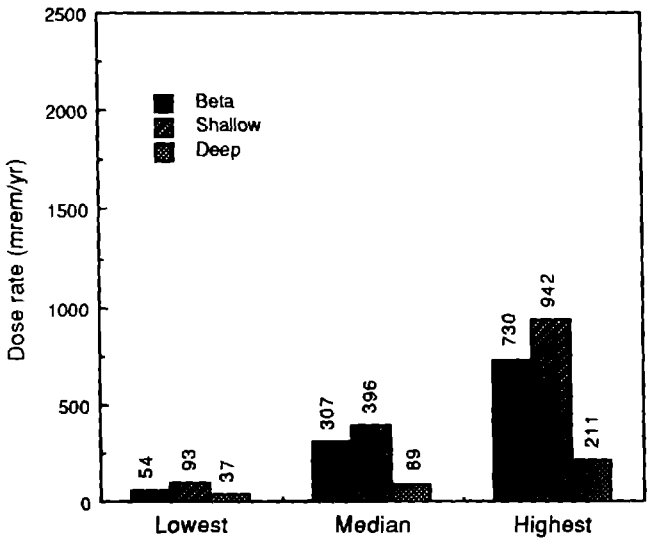


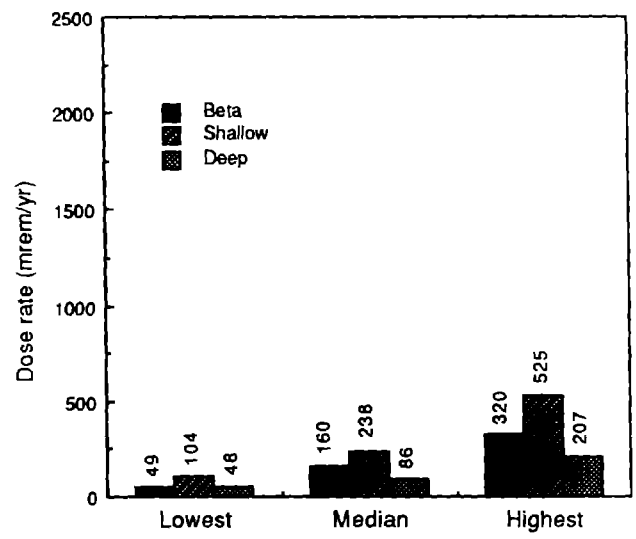
Dose rates on Bikini at 1 cm (left) and 100 cm (right) from ground.



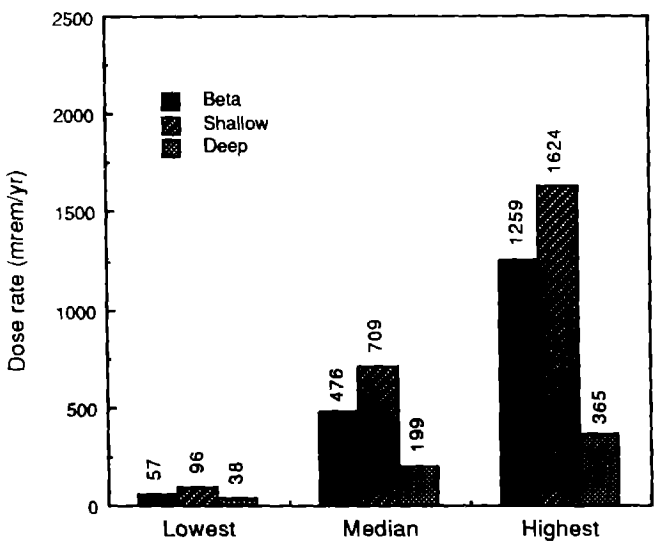


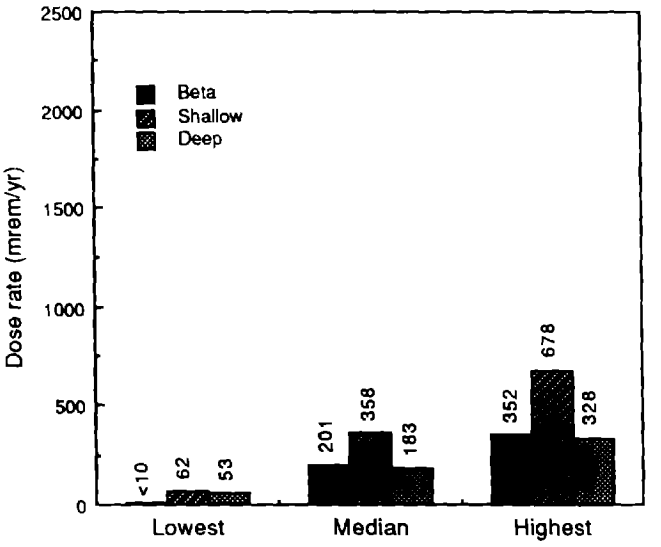
Dose rates inside houses at 1 cm (left) and 100 cm (right) from ground.



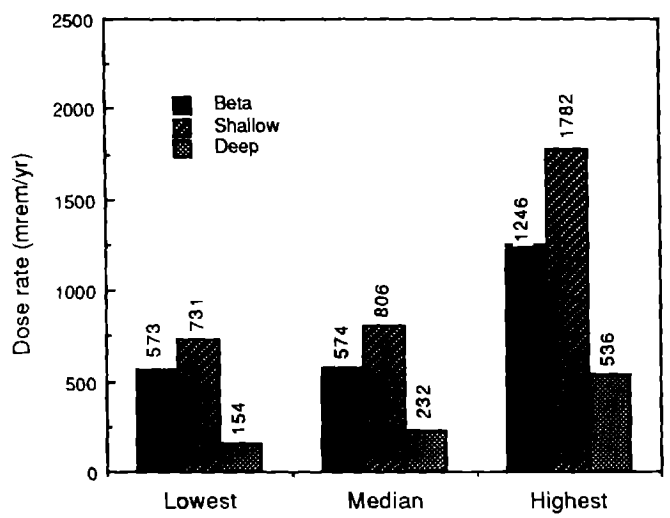


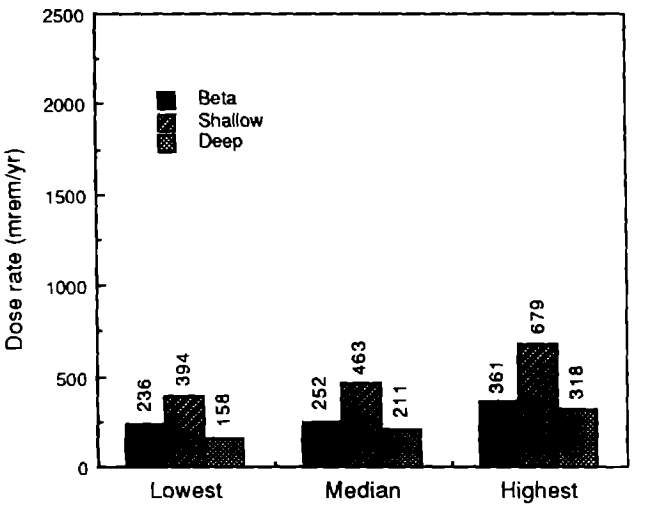
Dose rates around houses at 1 cm (left) and 100 cm (right) from ground.



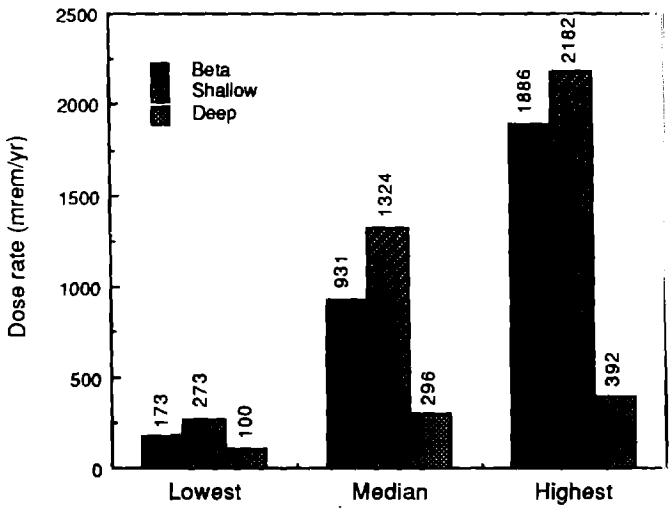


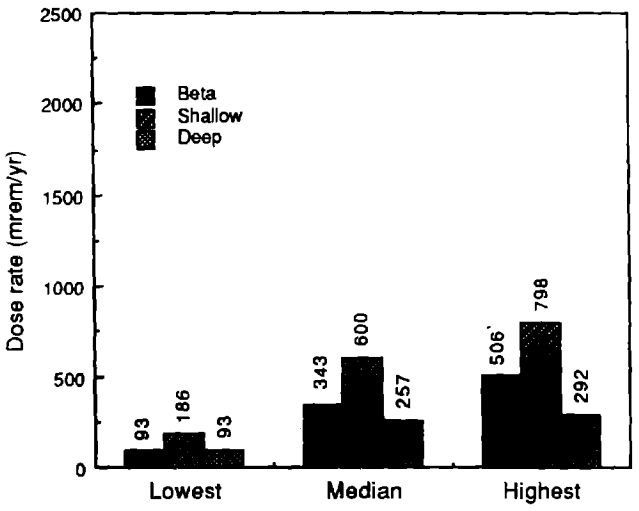
Dose rates in general areas at 1 cm (left) and 100 cm (right) from ground.



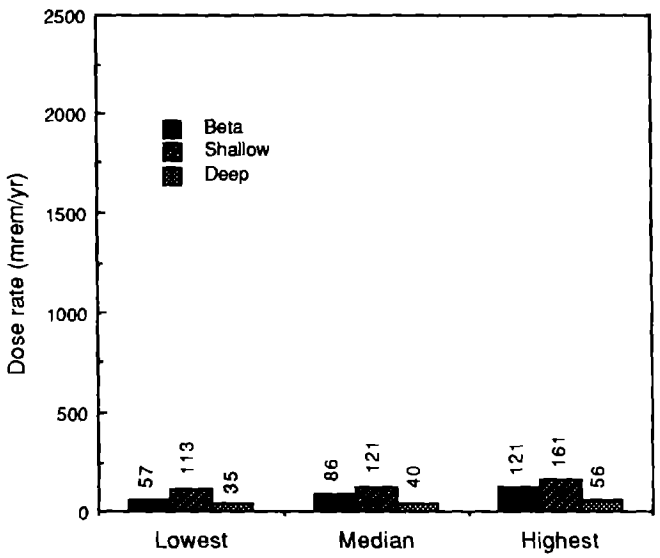


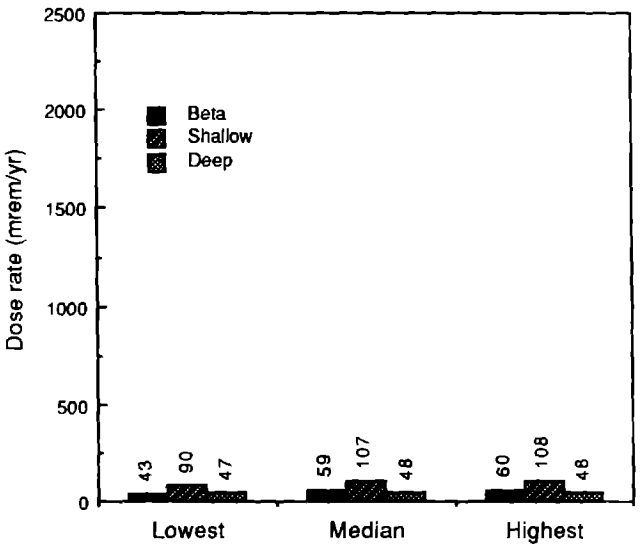
Dose rates in buffer zone at 1 cm (left) and 100 cm (right) from ground.





Dose rates in the excavation plot at 1 cm (left) and 100 cm (right) from ground.





Dose rates in excavation control plot at 1 cm (left) and 100 cm (right) from ground.

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Bikini Atoll Ionizing Radiation Survey
May 1985 — May 1986

Introduction

Between 1946 and 1958, the United States conducted 23 nuclear tests at the Bikini Atoll in the Marshall Islands. The single largest detonation was from the "Bravo" test, which resulted in extensive radioactive contamination of a number of islands in the atoll and prevented the timely resettlement of the native population. Since 1958, many studies have been conducted to assess cleanup options and the internal and external radiation doses the Bikinians would likely receive, should they resettle the islands. These studies have included assessment of: the external radiation dose rates from beta particles and gamma rays; the extent of soil, water, and vegetation contamination; the effect of excavation, fertilization, and irrigation on plant uptake of radionuclides; and the lifestyles and eating habits of the Bikinians.[1-6]

Although the external dose rates from beta and gamma radiation have been previously determined by aerial survey[4] and a variety of ground measurement techniques,[5,7] technical constraints limited the assessment of the external beta dose rates that result from the ^{137}Cs and $^{90}Sr/^{90}Y$ contamination on the islands. Now, because of the recent development of very thin thermoluminescent dosimeters (TLDs), the external beta dose rates can be measured.

Purpose

The purpose of this survey was to

1. Determine the beta dose rates and the shallow dose rates (beta + gamma) on Bikini and Eneu islands.
2. Compare the dose rates at heights of 1, 50, and 100 cm.
3. Determine the effect of various ground covers (e.g., coral gravel and vegetation) onthe beta and shallow dose rates.

Survey Summary

This survey was conducted in two 6-month phases, and results were based on data from 800 Panasonic-802 dosimeters. These dosimeters were distributed among 102 monitoring sites (used to determine the beta and gamma components of the radiation field), 11 beta spectrometer arrays (used to assess the maximum and average energy of the beta radiation), and 6 fade-study stations (used to assess environmentally induced fading of the Panasonic dosimeters). Table 1 shows the station distribution by island, phase, and type. Figures 1 and 2 show the station distribution on each island. At each station, corroborating data were obtained with LLNL TLD dosimeters, a Reuter-Stokes Pressurized Ionization Chamber (PIC), a Bicron Micro-R meter, and a NaI Field Instrument for the Detection of Low-Energy Radiation (FIDLER) detector associated with a Canberra multichannel analyzer.

Phase 1 dosimeters were placed in the field in May 1985 and retrieved in November of 1985. Phase 2 dosimeters were deployed in November 1985 and retrieved in May 1986.

Table 1. Distribution of dosimeter stations.

	Bikini			Eneu	
	Monitoring Sites	Spectrometer Arrays	ade udy	Monitoring Sites	Spectrometer Arrays
Phase 1	40	5	3	50	4
Phase 2	12	2	3		

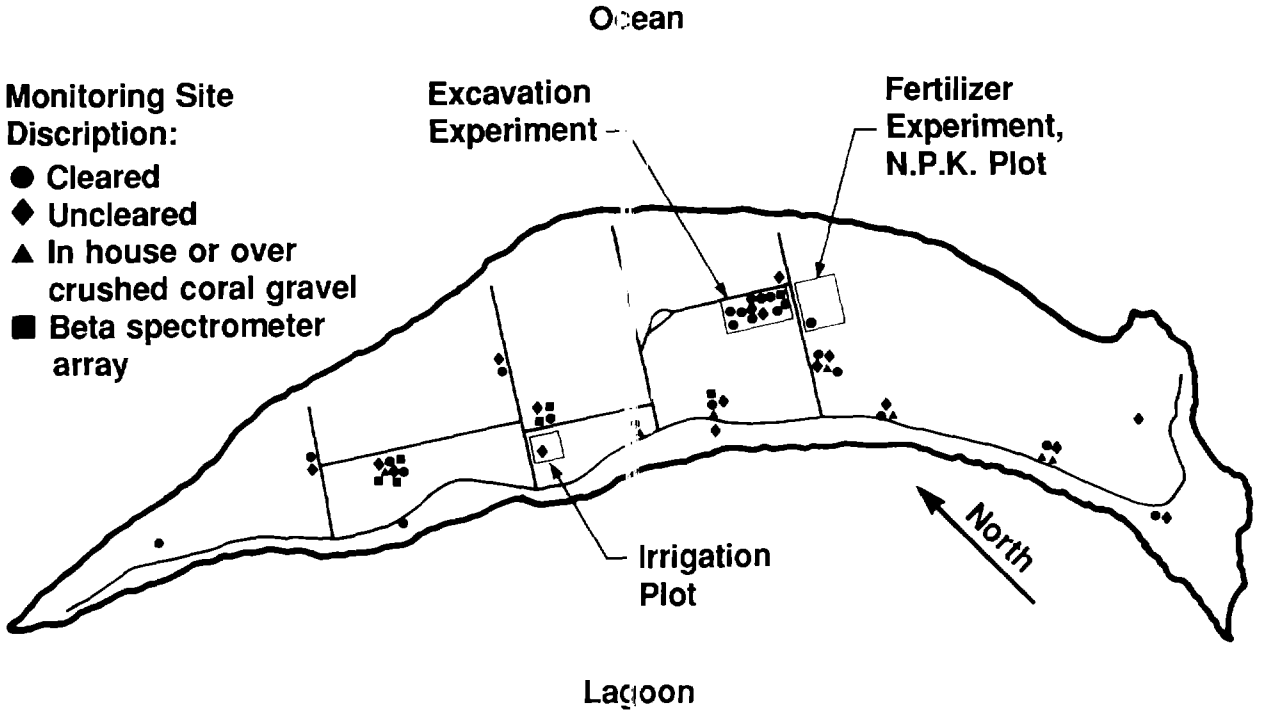

Figure 1. Distribution of monitoring stations on Bikini Island.

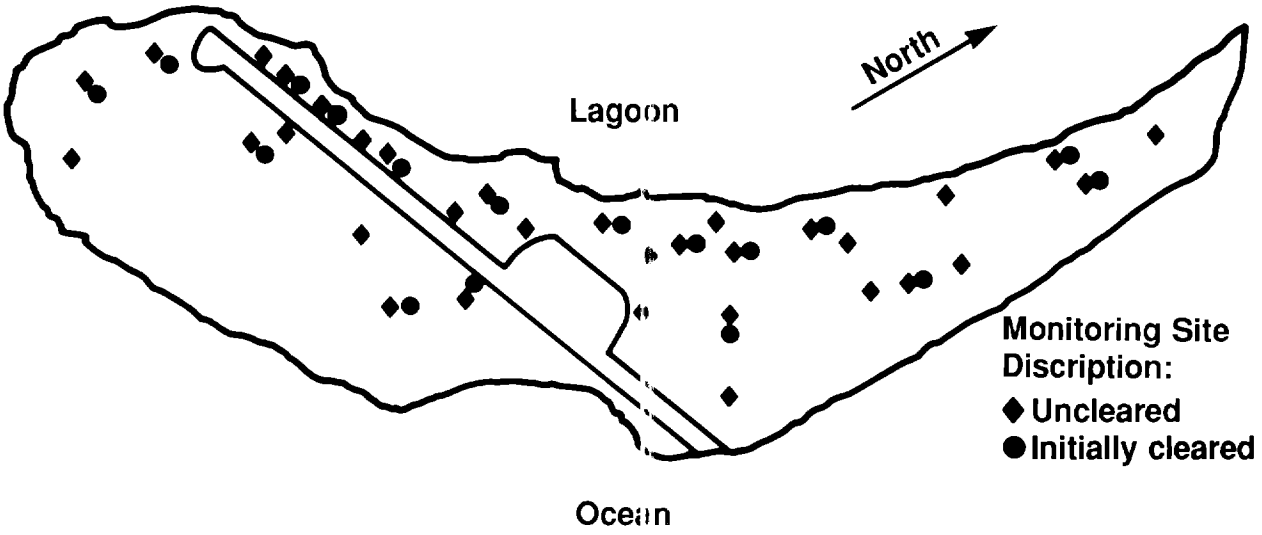

Figure 2. Distribution of monitoring stations on Enet Island.

General Information

Panasonic-802 Dosimeters

Description. Each Panasonic-802 dosimeter contained four TLD elements. Each element was 15 mg/cm^2 thick and consisted of a granular TLD material bonded to a mount strip consisting of a plastic film substrate backed by a carbon film. These films supplied a total of 11 mg/cm^2 filtration.[8] Each element was then covered by a teflon window, as shown in Fig. 3. The Panasonic holder covered Element 1 (E1) with a thin window 3 mg/cm^2 thick, Elements 2 and 3 (E2 and E3) with plastic 160 mg/cm^2 thick, and Element 4 (E4)

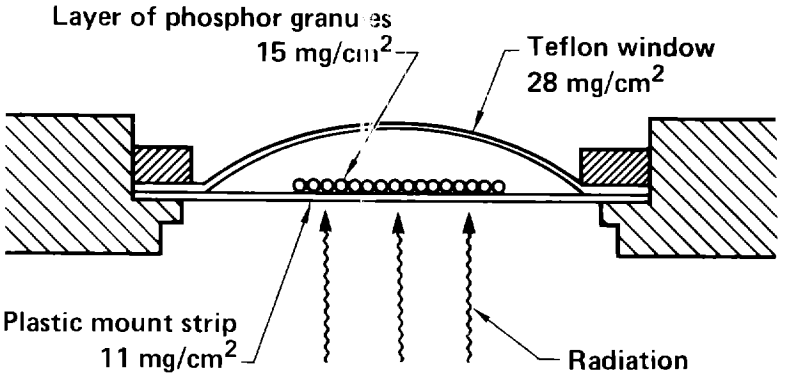

Figure 3. Construction of the Panasonic TLD element.

with plastic plus lead totaling 860 mg/cm^2 thickness.[9] E1 and E2 were $Li_2B_4O_7$:Cu, and E3 and E4 were $CaSO_4$:Tm.[10] Hereafter, $Li_2B_4O_7$:Cu will be referred to simply as 'Li,' and $CaSO_4$:Tm as 'Ca.'

Characteristics of Li and Ca TLDs. The low-temperature traps of Li and Ca TLDs fade to different extents during the first 24 hours after exposure. We eliminated these short-term fading effects by waiting 24 hours after the exposure to read the dosimeters.[9]

The Li TLDs have a relatively flat energy response to beta particles and photons. However, they are subject to long-term, environmentally induced fading.[11] In addition, the Li dosimeters are highly hygroscopic and are adversely affected by moisture.[12]

The Ca TLDs have a relatively flat energy response to beta particles and photons with energy greater than about 300 keV. However, they overrespond to low-energy photons by as much as a factor of 15, with the maximum overresponse occurring at energies less than 30 keV.[11] Ca TLDs are not significantly affected by long-term fading or moderate exposures to moisture.

Measurement Capabilities. In this survey, Panasonic dosimeters were exposed either in their holders, which contain plastic and lead absorbers, or out of their holders. The total absorber thicknesses indicated below include the plastic dosimeter mount strip and a protective Saran/mylar bag.

In-holder Panasonic TLDs measured the following:

E1: (Li—17 mg/cm^2 plastic absorber) beta and photon radiation.

E2: (Li—174 mg/cm^2 plastic absorber) an energy-dependent fraction of the beta radiation, and photon radiation.

E3: (Ca—174 mg/cm^2 plastic absorber) an energy-dependent fraction of the beta radiation, and photon radiation (which can include an overresponse to photons with less than about 300 keV of energy).

E4: (Ca—874 mg/cm^2 plastic plus lead absorber) photon radiation (with energy greater than approximately one hundred keV).

Out-of-holder Panasonic dosimeters measured the following:

E1 and E2: (Li—14 mg/cm^2 plastic absorber) beta and photon radiation.

E3 and E4: (Ca—14 mg/cm^2 plastic absorber) beta and photon radiation (which can include an overresponse to photons with less than about 300 keV of energy).

LLNL Dosimeters

Description. Each LLNL dosimeter contained three Harshaw TLD-700 LiF chips which were approximately 3 mm × 3 mm × 0.9 mm, and consisted of 99.993% ^{7}Li and 0.007% ^{6}Li.[13] Using enriched ^{7}Li minimizes the response to thermal neutrons. Before being used in the field, all chips were matched so that their responses to ^{137}Cs radiation were within 10% of the actual exposure. These chips were relatively insensitive to ambient levels of heat and moisture.

Measurement Capabilities. LLNL dosimeters were used in previous surveys of Enewetak and Bikini Islands to assess both beta and gamma radiation levels.[5,7] While the LLNL dosimeter's response to photon radiation was quite good, its response to beta radiation was difficult to quantitatively assess because of the thickness of the chip. In this survey, the LLNL dosimeters were used as an independent measurement of the photon radiation only.

Fielding the Survey

Preparation

Before leaving for Bikini, we analyzed the absorbers used in the beta spectrometer arrays and metal parts used to configure the monitoring sites with a very low background counter to ensure that they did not emit radiation above background level.

Transportation

All dosimeters were air freighted to Kwajalein and transported by ship to Bikini. The dosimeters were packed in a wooden box lined with 3/4-inch lead and 20-mil sheets of aluminum, copper, and cadmium. When measured in Livermore with a NaI(Tl) detector, the dose rate in the box was 1 μR/hr; the dose rate outside the box was 8 μR/hr.

Phase 1 Dosimeters. When the shielded shipping container arrived in Kwajalein with Phase 1 dosimeters, it was inadvertently stored next to several tons of high-potassium fertilizer. A small fraction (0.118%) of naturally occurring potassium is radioactive ^{40}K, which decays with a 1.3-MeV and a 0.483-MeV beta, and a 1.460-MeV gamma. Though we could not accurately determine the amount of time the

shipping container and the fertilizer were stored together, it did not exceed two weeks.

Upon arrival at Bikini, the Phase 1 Panasonic dosimeters were read and annealed using a Panasonic Reader, Model UD 702E, thereby removing any dose from travel and the high-potassium fertilizer. The LLNL dosimeters were not annealed because the necessary equipment was not available. In retrospect, it does not appear that annealing was necessary, since the fertilizer did not add a significant dose to the LLNL dosimeters, relative to the total doses measured.

Phase 2 Dosimeters. Phase 2 dosimeters had an unremarkable trip to Bikini and were deployed in the field without erasure of transportation dose.

Monitoring Stations

Each monitoring site consisted of eight dosimeters: one out-of-holder and one in-holder Panasonic dosimeter at heights of 1, 50, and 100 cm, and two LLNL dosimeters at 100 cm. The dosimeters were aligned so as not to shield each other from the ground.

Beta Spectrometer Arrays

Each beta spectrometer array consisted of five out-of-holder Panasonic dosimeters at heights of 1, 50, and 100 cm. At each level, one dosimeter was left bare, while the other four were covered with aluminum absorbers so that total absorber thicknesses were 14, 21, 48, 84, and 233 mg/cm^2, respectively.

In Situ Fade Study

To assess the degree of long-term, environmentally induced fading, an *in situ* fade study was conducted on Bikini. Two out-of-holder Panasonic dosimeters were sandwiched between thick aluminum absorbers and mounted in a holder equidistant from a 10 μCi ^{137}Cs source. The dosimeters were secured about one meter from the ground, protected from rain and sunlight, and left in this configuration for six months, such that the dosimeters were exposed at a rate that far exceeded the ambient levels of photon radiation. Since any beta response was eliminated by the aluminum absorbers, and both Li and Ca respond linearly to the 662-keV photons from ^{137}Cs, any fading of the Li relative to the Ca would be evident by comparing the measured doses at the end of the experiment.

Three fade study sites were selected, representing the full range of thermal environments: one in a house protected from direct rain and sunlight, one in a breezy, semi-shaded area, and one in the middle of the island where there was intense sunlight and little breeze.

Packaging of Dosimeters

All Panasonic dosimeters were heat-sealed in Saran Wrap bags that were lined with aluminized mylar. The Saran bag (2 mg/cm^2) provided moisture protection; the reflective aluminized mylar (1 mg/cm^2) minimized heat buildup in the bag. The 3 mg/cm^2 supplied by the Saran/mylar bag and the 11 mg/cm^2 from the plastic mount strip are included in the absorber thicknesses listed in this report. See Fig. 4.

LLNL dosimeters contained three Harshaw TLD-700 LiF chips loaded in "poker-chip" containers. The capped side of each dosimeter was weather protected by another unloaded poker-chip, and half of these units were then sandwiched between 857 mg/cm^2 aluminum absorbers. This configuration was chosen to duplicate that used in the Enewetak study.[7] See Fig. 5.

LLNL dosimeters were exposed from the uncapped side of the poker chip, through either 45 mg/cm^2 plastic, or 902 mg/cm^2 plastic plus aluminum.

As shown in Fig. 6, bagged Panasonic dosimeters were placed between aluminum supports that were stapled to wood blocks. A layer of plastic tape was placed over the top and sides of the dosimeters to protect them from direct rain and sunlight.

LLNL dosimeters were held in place by wedging them in holes cut in the wood blocks, but this method was only partially successful during Phase 1, because when the wood swelled from moisture, 14% of the LLNL dosimeters fell out. We solved this problem for Phase 2 exposures by stapling a thin plastic tie across the holes on the bottom of the wood block, taking care not to shield any of the TLD chips. We then placed plastic tape over the top of the holes to protect the dosimeters from rain.

Site Selection

Monitoring sites on Bikini and Eneu Islands were selected on the basis of anticipated Marshallese lifestyle. Emphasis was given to areas where people would likely spend the most time. For example, as was shown in Figs. 1 and 2, we used proportionately more monitoring sites on the lagoon sides of the islands than on the ocean sides, reflecting the Marshallese preference for housing locations.

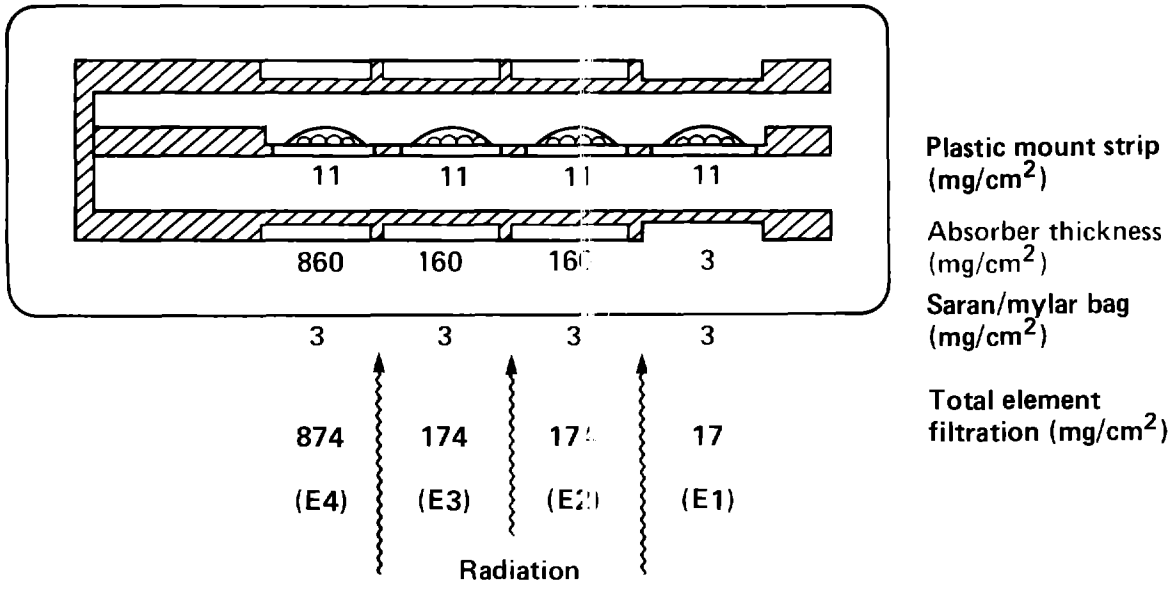

Figure 4. Packaging for in-holder Panasonic dosimeters.

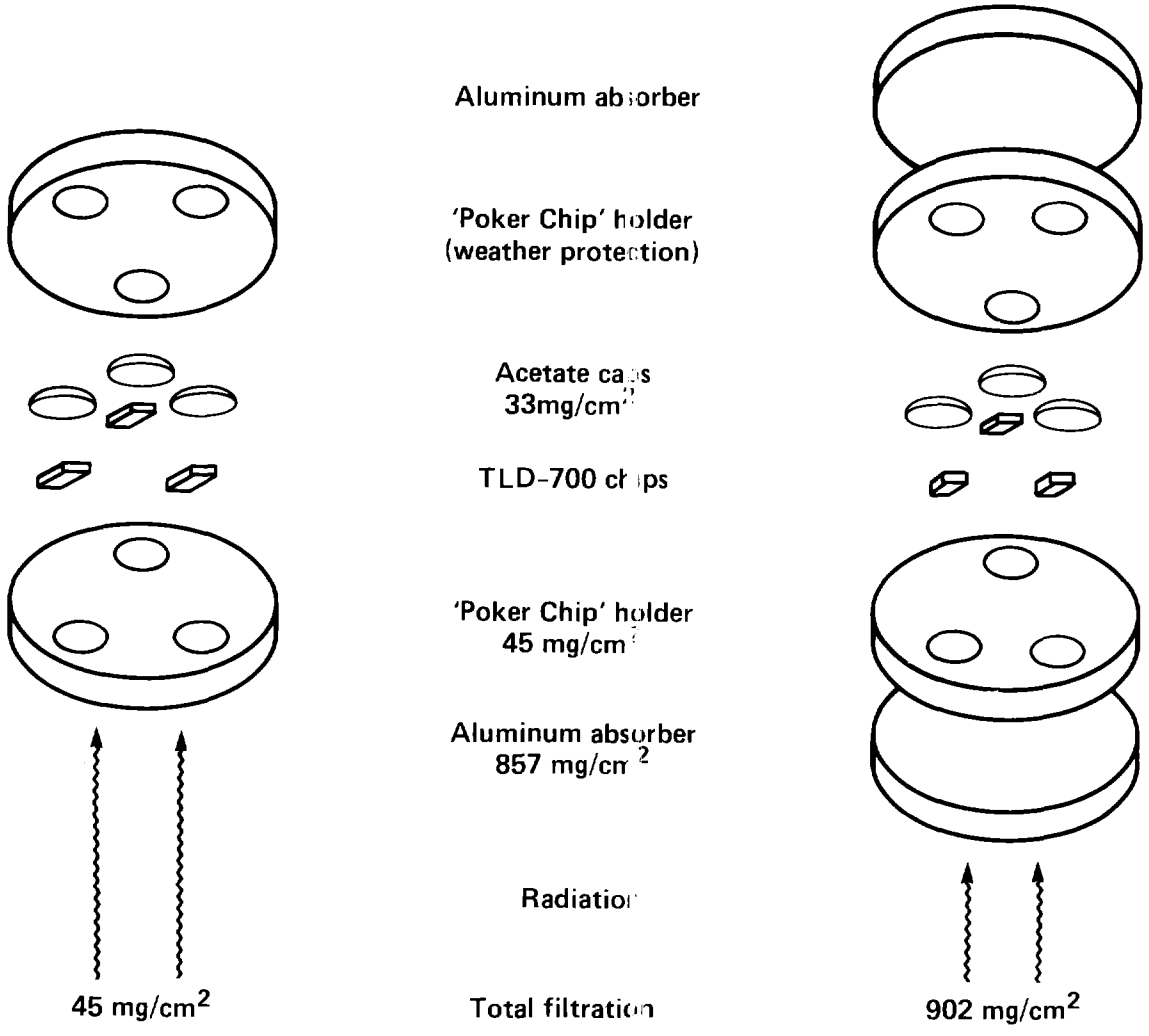

Figure 5. Packaging for LLNL dosimeters.

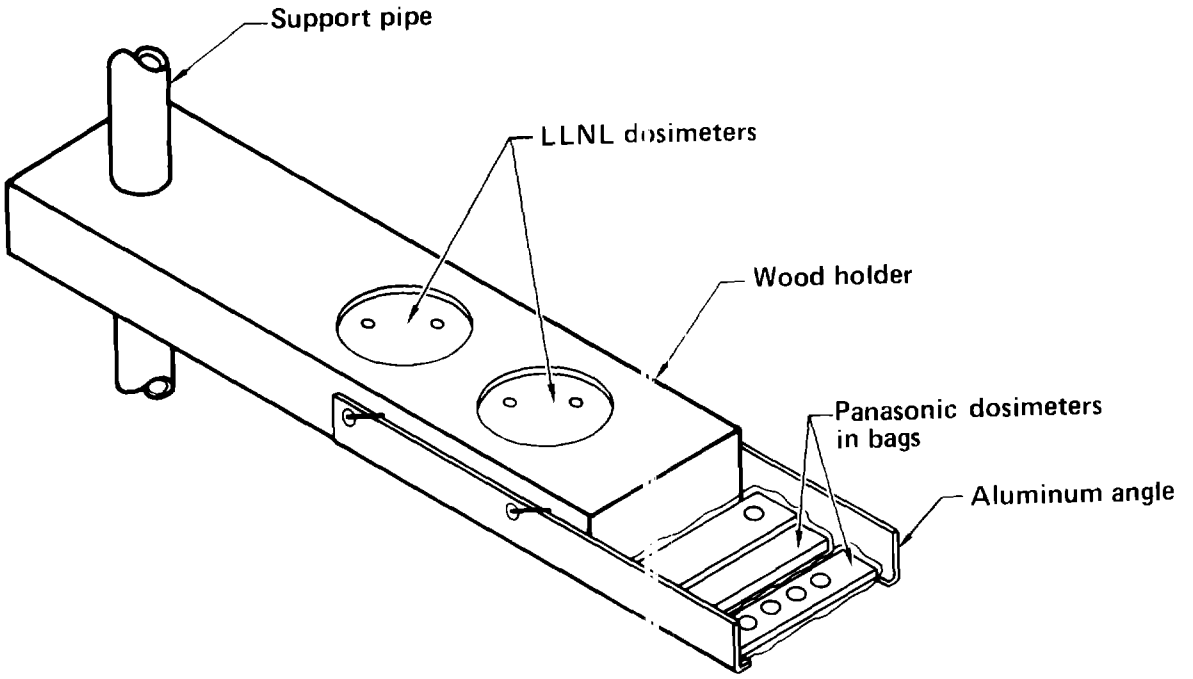

Figure 6: Dosimeter holding device.

To establish an upper bound for radiation doses, we used information from previous EG&G overflight radiation surveys to select a number of sites in the most contaminated areas of Bikini.[4] To attempt assessment of the effect of ground cover on radiation levels, we included two adjacent sites in many of the areas monitored, one of which was cleared of plants and debris, and one of which was left uncleared.

The Marshallese often place a 5- to 10-cm-thick layer of coral gravel around their homes, and so we made measurements over two such areas for comparison with dose rates measured 10–30 meters away, in back yard areas. We anticipated difficulties comparing the beta data from these sets of sites, since the gamma dose rates varied significantly between them. So, during Phase 2, we placed a 1-m-radius pad of coral gravel in two highly contaminated areas on Bikini and put a monitoring station in the center of each. Nearby, in an area with the same PIC measurement, we established stations over cleared and uncleared soil.

We also placed considerable emphasis on the Excavation Plot—an experimental garden established in the most contaminated area of Bikini. All plants and the top 40 cm of soil had been removed from this 2-acre plot, where different crops were then fertilized and grown. The Control Plot, equal in size and adjacent to the Excavation Plot, was also stripped of plants and used as an experimental garden, but the topsoil was left essentially undisturbed. A 90-foot-wide Buffer Zone, left in its natural condition, separated the Excavation and Control Plots.

When evaluating data from this survey, especially the mean and median doses listed in Table B2, it is important to remember that these values *do not* reflect the mean and median doses for the whole island, since we made no effort to evenly distribute dosimeters across the islands.

Site Establishment

When each station was established, gamma dose rates were measured using a Reuter-Stokes Pressurized Ionization Chamber. To ensure that no significant changes occurred over the exposure period, μR meter readings were taken when the site was established, and again when the dosimeters were retrieved. We found no significant differences between the pre- and post-exposure μR meter readings, so these data are not included here. Each site was photographed at the beginning and end of the exposure period, and notes were taken regarding local vegetation, exposure to sun, surface type, etc. Figure 7 illustrates a typical dosimeter station.

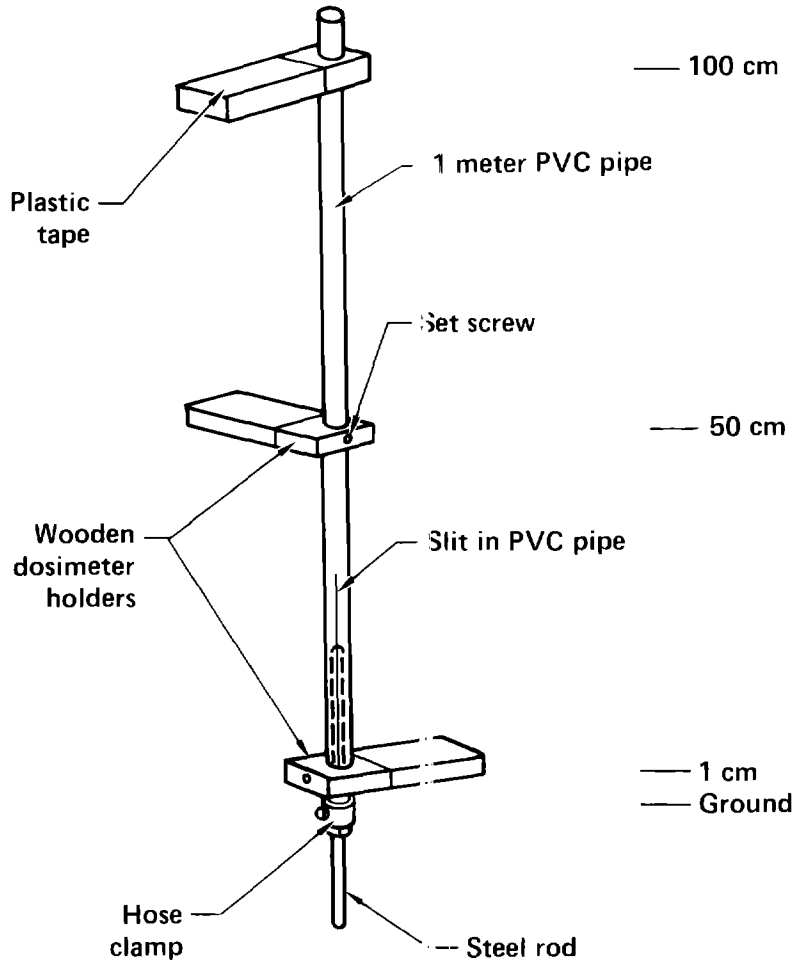

Figure 7. Configuration of monitoring station.

Environmental Effects on Monitoring Stations

The typical rainy season on Bikini lasts from June through November. Though we were fairly successful in protecting the dosimeters from the excessive moisture, we were unable to control the plant growth that occurred around the monitoring stations. When we returned to the islands in November, we found a number of sites on Eneu where morning glory vines had completely engulfed the PVC pipe holding the dosimeters. In a few other areas, grasses that had previously been fairly sparse had grown thickly up to the 50-cm monitoring height. This excessive plant growth often provided a continuously damp environment at the 1-cm level, and in many cases the Saran/mylar bags were not capable of protecting the Li TLDs.

An interesting phenomenon not associated with the rainy season was the response of the aluminized mylar to prolonged field exposure. In areas that received little reflected light (e.g., in houses or over grassy areas), the Saran/mylar bags appeared unaffected by the six-month exposure. However, in sandy areas where there was much reflected light, the aluminum often disappeared from portions of the mylar. Locations with moderate amounts of reflected light produced gradations of effects, ranging from slight mottling of the aluminum to a homogenous, hazy transparency.

Dosimeter Collection

In November 1985, a low-energy (10–110 keV) gamma spectrum was recorded at each Phase 1 and Phase 2 site, using a 5-inch-diameter × 1/16-inch-thick NaI detector with a thin beryllium window (i.e., a FIDLER, a Field Instrument for the Detection of Low-Energy Radiation) connected to a Canberra Model-10 multichannel analyzer. The spectra were recorded on magnetic tape.

After collection from the field, Panasonic dosimeters were removed from their Saran/mylar bags, checked for proper labeling and identification, sealed in plastic bags with a desiccant, and stored in the lead shipping container.

Data Analysis

Application of Element Correction Factors (ECFs)

Element correction factors (ECFs) were used to normalize the response of each Panasonic element so that all elements gave the same result for a given dose of ^{137}Cs radiation. We determined the ECF for each element before the dosimeters were used on Bikini, and again after their return from the islands. The average of the before- and after-exposure ECF was used to correct the data, except in cases where the before-exposure ECF varied by more than 25% from the before/after average. Elements that fell into this latter category had all been partially dissolved during the exposure period; we deleted data from these elements, since a greatly changed ECF indicated element damage. Through this process, we deleted 0.3% of the Ca data and 2.2% of the Li data; had the cutoff been 20% rather than 25%, an additional 1.9% of the Li data would have been deleted. The lower cutoff would not have affected the Ca data, nor the results of this study, since only Ca elements were ultimately used for dose-rate determination.

It is interesting to note that some Li elements that appeared damp or wet when retrieved from the field indicated doses clearly less than corresponding elements, but were not eliminated by this ECF comparison. We suspect that some dosimeters were not permanently damaged by moisture, though some portion of the recorded dose was lost when the crystals dissolved. Resolidification of the dosimeter material seems to have restored the original dose response.

Correction for Contaminated Panasonic Holders

As the data from Eneu was analyzed, we noticed that approximately 1/3 of the E4 in-holder data, with 874 mg/cm^2 filtration, indicated dose rates of 9 or 10 μR/hr, while E3, with 174 mg/cm^2 filtration, indicated dose rates of 4 or 5 μR/hr. E3 and E4 out-of-holder data agreed closely with the E3 in-holder data.

To identify the source of this added dose rate, we analyzed a number of dosimeter holders with a gamma spectrometer, a Si(Li) x-ray detector, and a gas-flow proportional counter. The gamma and x-ray analyses showed no activity; however, those holders with elevated E4 readings indicated a beta activity three times the counter's background (3 cpm vs 1 cpm). Calculations show that a flux of just 0.05 betas/cm^2/second would result in a dose rate of approximately 5 μR/hr to the dosimeter.

This increased dose rate likely originated in the lead covering E4. Newly refined lead is contaminated with ^{210}Pb, a daughter product of ^{226}Ra. ^{210}Pb has a 20-year half-life and decays with insignificant radiations to ^{210}Bi, which has a 5-day half-life and decays with a 1.16 MeV (max) beta.

By inspection, we identified the Eneu data affected by contaminated dosimeter holders, since the E1 readings were almost twice the E3 readings, averaging 4.6 ± 0.7 μR/hr more than the corresponding E3 average of 5.5 ± 2 μR/hr. We corrected these data by subtracting 5 μR/hr from the affected elements.

Statistically, an additional 4.6 μR/hr dose rate could not be distinguished from the actual dose rates on Bikini, since ambient radiation levels were substantially higher on Bikini than on Eneu. Therefore, we beta-counted the dosimeter holders used on Bikini to identify those with contaminated lead. Those exceeding the background count rate by two standard deviations were considered contaminated, and 5 μR/hr was subtracted from the data of the respective E4 elements.

Correction for Dosimeters Exposed Out-of-Holder

Calibration of Panasonic dosimeters (and ECF determination) was done with the dosimeters in their holders. However, in this study, half of the dosimeters were exposed out of their holders. When we exposed 20 out-of-holder dosimetersto two different calibration sources, we noticed that E4 *always* indicated a dose less than E3.

We surmise that this phenomenon occurred as a result of the calibration process, during which photon scatter off the lead absorber covering E4 caused an artificially high dose to E4. ECFs, which were automatically applied during the readout process, corrected for this added dose. Because E4 elements exposed out-of-holder did not receive an artificially high dose, the ECF correction generated an artificially low E4 reading.

Evaluation of data from the out-of-holder dosimeters exposed to the calibration sources revealed that E1, E2, and E3 were all in good agreement, but the E4 readings showed a consistent 10% reduction relative to E3 readings. To correct for this reduction, we multiplied all out-of-holder E4 data by a factor of 1.1.

Assessment of the Fade Study

Data from the six fade-study sites were used to compare the response of the Li TLDs relative to the Ca TLDs. Because all the Li data were within two standarddeviations of the respective Ca data, we applied no fade correction to the Li data.

Assessment of Background and Transportation Doses

The raw data given in Appendix A of this report include natural background, but the dose rates reported in Appendix B have had the cosmic ray contribution of 3.3 μR/hr subtracted. This background value was estimated by Gudiksen, et al., from measurements made by a number of different researchers.[5] Although we acknowledge some unspecified error associated with this value, we used the number as a constant, since the actual error was not reported in the literature.

Control dosimeters were exposed to 300 mrem before being taken to Bikini and were left in a shielded container on Kwajalein for the duration of the exposure period. After returning to Livermore, these dosimeters read 309 ± 14 mrem, indicating that any transportation dose was insignificant. Panasonic data from Eneu supports this finding, since measurements in many areas indicated exposure rates less than 4 μR/hr, with the lowest being 3.5 μR/hr. Since the background exposure rate is 3.3 μR/hr, and 3.3 and 3.5 are statistically indistinguishable from one another, no specific correction was made for transportation dose.

Calculation of Deep-Dose rates

Since beta and low-energy photon radiation do not significantly penetrate the lead and plastic filter covering E4, we used in-holder E4 data to assess the exposure rate in air from penetrating gamma radiation.

For risk estimates, the United Nations Scientific Committee on the Effect of Atomic Radiation (UNSCEAR) recommends calculating actual doses to specific organs.[14] Kerr, and O'Brien and Sanna have made extensive measurements converting exposures in air to doses in specific organs.[15,16] We chose to use Kerr's conversion factor for the testes, (0.75 rads in tissue/R in air, at 662 keV),[15] since it provided a conservative estimate for almost all other organ doses, and because the dose to the testes had been reported in previous Bikini publications. Assuming 1 rem/rad, the final conversion of 0.75 rem in tissue/R in air agrees closely with UNSCEAR's value of 0.71 rem to the testes/R in air.[14]

For dose planning purposes, the International Commission on Radiation Units and Measurements (ICRU) recommends using a depth of 1 g/cm^2 for calculating deep doses.[17] The exposure rate in air measured with in-holder E4 can be converted to a dose rate in tissue at 1 g/cm^2 by multiplying by a conversion factor of 1.03 rads in tissue/R in air,[18] given that the exposure is from ^{137}Cs. To obtain the effective dose equivalent, this value must be multiplied by approximately 0.7,[17] generating a value that agrees closely with those reported by Kerr, O'Brien and Sanna, and UNSCEAR.[14-16]

Deep doses in this report are listed as organ doses (D(Or)) when the 0.75 rem/R conversion is used, and at the depth of 1 g/cm^2 (D(1 cm)) when the 1.03 rem/R conversion is used.

A pressurized ionization chamber (PIC) and LLNL TLD-700 dosimeters were used for an independent measurement of the penetrating gamma dose rates. Table 2 shows the relationship between the exposure rates measured by the PIC and LLNL dosimeters, relative to the 100 cm height, in-holder E4 dosimeter.

Table 2. Comparison of LLNL TLDs and PIC measurements relative to Panasonic E4(I).

	Percent of Readings Within Specified Range		
Range	LLNL (902 mg/cm²)	LLNL (45 mg/cm²)	PIC
± 20% of E4(I)	90	92	88
± 21–30% of E4(I)	6	4	8
± >30% of E4(I)	4	4	4

The correlation coefficient for E4(I) and the PIC was 0.98, but the TLDs had a –12% bias; that is, the TLDs read 12% lower than the uncorrected PIC readings. This matter is discussed further in the "Statistical Analysis" section, on page 12.

Assessment of Low-Energy Photon Dose Rates

As previously mentioned, Ca overresponds to low-energy photons by as much as a factor of 15, depending on the photon energy, with the maximum overresponse occurring at less than 30 keV.[11] To determine if a correction for Ca overresponse was necessary, we compared E3 (Ca) and E2 (Li) in-holder data, both of which are covered by 160 mg/cm² plastic; this plastic attenuates only 4% of 30-keV photons. The dose on E3 exceeded that on E2 by more than three standard deviations in only 3.9% of the cases, indicating that low-energy photons made an insignificant contribution to the total radiation dose. Analysis of spectra taken with the FIDLER/Canberra multichannel-analyzer corroborate this finding. Therefore, we did not make a correction for Ca overresponse.

Comparison of Li and Ca TLD Response

For each out-of-holder dosimeter, we compared E1 and E2 (Li) data to E3 and E4 (Ca) data. In 85% of the cases, the average of E1 and E2 fell within three standard deviations of the average of E3 and E4.

In 7% of the cases, the reported Li dose was greater than the Ca dose. However, all of these cases occurred in low background areas where the total doses measured were approximately 25 mrem. We believe this anomaly to be statistical in origin, since Li emits relatively few light units per unit dose. Thus, when reading low doses, small statistical fluctuations in TLD light output result in dose fluctuations that are a considerable fraction of the total recorded dose.

In 8% of the cases, the Li response was less than the Ca response. Interestingly, all but one of the out-of-holder dosimeters found in transparent bags were included in this group. We have concluded that the aluminized mylar, when it remained intact, was effective in reflecting light and minimizing heat buildup in the Saran bag. When the aluminum on the mylar disappeared, the Li faded either from heat buildup or from exposure to light.

Li TLDs were adversely affected by moisture, heat, and light, and had limited accuracy at low doses. Ca TLDs did not have these limitations. Moreover, we had no low-energy Ca overresponse to contend with. Therefore, in this survey, only the Ca data (E3 and E4) were used to calculate the reported dose rates.

Assessment of Beta Spectrometer Arrays

We normalized the data from each beta spectrometer array to the respective 14 mg/cm² absorber data, and then plotted the absorber thickness vs dose rate. We compared these curves to ones similarly generated with calibration sources of $^{90}Sr/^{90}Y$ (β_{max} = 2.27 MeV) and ^{204}Tl (β_{max} = 0.766 MeV). The calculated endpoint energy from the beta spectrometer arrays corresponded to that of ^{90}Y, but the curves generated with field data decreased faster than the ^{90}Y curve and slower than the ^{204}Tl curve. From this information, we concluded that the average energy of the beta spectrum lies somewhere between that of ^{90}Y and ^{204}Tl.

As an additional check, we calculated the beta energy spectrum at the ground's surface using the Monte Carlo transport code SANDYL and a typical Bikini soil analysis.[2] The curves generated by the Monte Carlo code corroborate our interpretation.

Calculation of Beta Dose Rates

Having established that the average energy of the beta spectrum lies somewhere between that of ^{90}Y and ^{204}Tl, we exposed 20 out-of-holder bagged dosimeters to National Bureau of Standards (NBS) calibrated sources of these materials. At 7 mg/cm^2, the efficiency of the Ca TLDs to ^{90}Y was 85%, and to ^{204}Tl was 72%. Since it is very difficult to fine tune the calibration beyond these limits, we chose to use a calibration midway between these points, at 79%, yielding a calibration error that varied less than 10% from either endpoint.

In this survey, beta dose rates were determined by averaging the E3 and E4 out-of-holder data (which measures beta and gamma radiation), subtracting the corresponding E4 in-holder data (which measures gamma only), and dividing by 0.79 to give the beta dose rate at 7 mg/cm^2.

Calculation of Shallow Dose Rates

At 662 keV, the conversion factor for radiation dose to the skin ranges from 0.685 rad in tissue/R in air to 0.78 rad in tissue/R in air.[15,16] As a conservative selection, we chose to use 0.75 rad in tissue/R in air, which was the same conversion factor used to convert exposure in air to dose in organs (D(Or)). Shallow dose rates were then calculated by adding the beta dose rate to the skin dose rate, which was numerically equal to the deep-dose rate (D(Or)) (i.e., Sh = β + D(Or)).

Statistical Analysis

The precision of measurements using E3 and E4 was experimentally determined at doses of 25, 50, 100, and 300 mrem. After a total of 800 exposures, we found the standard deviation associated with E3 and E4 at all four dose levels to be 6.6% ± 0.5.

The accuracy of Panasonic measurements was evaluated through use of control dosimeters that, as previously mentioned, were exposed to 300 mrem before being taken to Bikini and were left on Kwajalein during the exposure period. Since these dosimeters and those used on Bikini and Eneu were exposed to similar temperatures and humidities for a substantial portion of the exposure period, and the average dose reported at the end of the exposure period was 309 ± 14 mrem, we concluded that the measurements made with the Panasonic dosimeters were neither enhanced nor degraded as a result of the experimental exposure conditions.

The above information was corroborated by uncorrected PIC measurements, in which 34% of the PIC readings were within 10% of the respective E4(I) measurements, and 88% were within 20% of the respective E4(I) measurements. The correlation between these data was 0.98, with a bias of 12% (the PIC data were higher than the TLD data). Because the residual fallout activity varied across the islands, correction of the PIC data would require detailed information about the energy spectrum at each measurement site, and could result in as much as a 9% reduction of the PIC readings. Since the PIC data cannot be specifically corrected with the data available to us, we used PIC data only to corroborate the Panasonic TLD data.

On the basis of the precision and accuracy of the Panasonic dosimeters, we concluded that the total experimental error on the values reported in Appendix A was approximately ±15% at the 95% confidence level.

Using this information, we propagated the errors to report the 95% confidence interval of the dose rates in Appendix B. We assumed that the background value of 3.3 μR/hr and the conversion of 0.75 rad in tissue/R in air were constants, and reported the errors as percents.

Minimum Detectable Beta Activity

Using a one-tailed Student's t-test, the minimum detectable beta dose (MDBD) was calculated to be 18% of the deep-dose rate (D(Or)). For example, if the deep-dose rate was 4 μrem/hr, the minimum detectable beta dose was 0.72 μrem/hr, corresponding to an annual beta dose rate of 6.3 mrem/yr. If the deep-dose rate was 50 μrem/hr (438 mrem/yr), the minimum detectable beta dose was 9.0 μrem/hr, or 79 mrem/yr.

If the beta activity at a given location was less than the minimum detectable beta doze (MDBD), the value was listed in Table B2 as "< MDBD," where the MDBD is calculated as (0.18)(D(Or)). When computing the median and mean dose rates in Table B2, the less-than symbol was ignored, and MDBD value used.

Discussion of Results

Appendix A contains the raw data generated in this study; and Appendix B gives the calculated beta, shallow, and deep-dose rates. Appendix B includes two tables: the determination of dose rates on Bikini and Eneu (Table B1), and dose rate summaries in mrem/yr (Table B2).

Some data have been omitted from this publication solely because of the lengthiness of the supporting information. Any of these data can be obtained from the authors.

The dose rates reported in the following discussions do not include natural background, and deep-dose rates refer to the effective dose equivalent[17] (i.e., organ doses, consistent with the UNSCEAR methodology of dose rate determination).[14] However, these dose rates should not be used as an absolute indicator of potential personnel doses, since people obviously do not remain in a single spot for extended periods, and doses on Bikini are received from both internal and external sources of radiation. To assess potential doses to people, such factors as the amount of time spent in various areas and the types and amounts of food consumed must be evaluated. Such assessments have been done, and reports on these topics are available.[1,2,3,5]

Dose Rates on Eneu

The mean beta dose rate on Eneu was 23 mrem/yr at 1 cm off the ground, and 6 mrem/yr at 100 cm off the ground. The mean shallow dose rates varied from 40 mrem/yr at 1 cm to 24 mrem/yr at 100 cm; the mean deep-dose rate was approximately 18 mrem/yr at all heights. The highest beta and shallow dose rates measured anywhere on the island were 90 and 138 mrem/yr at 1 cm, and 42 and 82 mrem/yr at 100 cm. The highest measured deep-dose rate was 88 mrem/yr. However, at only three areas on the island did the measured deep-dose rate exceed 30 mrem/yr, and one of these areas was near a potassium fertilizer experiment.

Natural ground cover had no effect on the dose rates.

Dose Rates on Bikini

Bikini's radiation profile was more complicated than Eneu's since there were many unique areas to be evaluated. Therefore, to clarify the discussion of dose rates, we divided the data obtained on Bikini into subgroups, and calculated the high, median, mean, and low dose rates for each subgroup in units of mrem/yr (Table B2).

In general, the highest beta dose rate measured in each subgroup was 1.5–2.5 times the mean, and the highest deep-dose rate was 1.5–2 times the mean. Exceptions to this generalization existed in the Excavation Plot and inside houses, where the dose rates varied little between sites.

In Houses. We were surprised to detect significant beta radiation in two of the three houses surveyed, until we found out that the concrete used in some houses had been made from island aggregate, while concrete used in other houses had been made from coral reef aggregate. No beta radiation was detected in the house made from reef aggregate, but the average beta dose rate in the houses made from island aggregate was 116 mrem/yr at 1 cm, 63 mrem/yr at 50 cm, and 46 mrem/yr at 100 cm. As a group, the mean beta dose rate measured in the three houses was 80 mrem/year at 1 cm and 34 mrem/yr at 100 cm. The mean shallow dose rate ranged from 119 mrem/yr at 1 cm to 70 mrem/yr at 100 cm, and the mean deep-dose rate was about 37 mrem/yr at the 1, 50, and 100 cm heights.

Around Houses. This group constitutes areas covered with coral gravel, side yards, and areas behind houses where children might play. Here, the mean beta dose rate ranged from 301 mrem/yr at 1 cm to 165 mrem/year at 100 cm, and the mean shallow dose rate ranged from 408 mrem/yr at 1 cm to 277 mrem/yr at 100 cm. The mean deep-dose rate varied from 107 to 112 mrem/yr.

General Areas. This group comprises all sites that were not in houses, around houses, or associated with the Excavation Plot. This group does not reflect an island average, though, since we purposefully selected a disproportionate number of sites in highly contaminated areas.

The mean beta dose rate ranged from 550 mrem/yr at 1 cm to 192 mrem/yr at 100 cm, and the mean shallow dose rate ranged from 760 mrem/yr at 1 cm to 376 mrem/yr at 100 cm. The mean deep-dose rate varied from 184 to 210 mrem/yr.

Excavation Experiment. *Buffer Zone and Control Plot.* Both the beta and the deep-dose rates varied greatly in the Buffer Zone and the Control Plot,

probably as a result of soil disturbances that occurred during excavation and planting. Because of this great variation, the average of these dose rates is of limited value, since it does not give an accurate picture of the radiation environment. Therefore, rather than calculating the means for this group as a whole, we broke the group in half and calculated means for the sites with the highest dose rates (Sites 17, 20, and 29) and the lowest dose rates (Sites 12, 13, and 30). The average for the total group is simply the average of these two values. In general, at the 1-cm height we found approximately a factor of 3 difference between the means of the high and low dose rate groups; at the 100-cm height, we found a factor of 2 difference between these groups.

The mean 1-cm height beta dose rate was 1354 mrem/yr in the high group and 440 mrem/yr in the low group; at the 100-cm height, the mean beta dose rate was 404 mrem/yr in the high group and 194 mrem/yr in the low group.

The mean 1-cm height shallow-dose rate was 1763 mrem/yr in the high group and 603 mrem/yr in the low group; at the 100-cm height, the mean shallow dose rate was 692 mrem/yr in the high group and 348 mrem/yr in the low group.

The deep-dose rates also varied significantly in these areas, with the low dose rate group measuring 163 mrem/yr at the 1-cm height and 154 mrem/yr at the 100-cm height, and the high dose rate group measuring 408 mrem/yr at 1 cm and 289 mrem/yr at 100 cm. The reason for the 30% variation with height in the high dose rate group was not apparent.

Excavation Plot. The dose rates in the Excavation Plot were consistently low: the mean beta dose rate was 88 mrem/yr at 1 cm and 54 mrem/yr at 100 cm, and the mean shallow dose rate was 131 mrem/yr at 1 cm and 102 mrem/yr at 100 cm. The mean deep-dose rate varied from 35 mrem/yr at 1 cm, to 47 mrem/yr at 100 cm. Removing the top 40 cm of soil reduced the beta dose rate between 80 and 94% at 1 cm, and between 72 and 87% at 100 cm.

Variation of Dose Rate with Height

The data from general areas on Bikini showed that at 1 cm, the mean beta dose rate was about 2.5 times the respective mean deep-dose rate; at 50 cm, it was 1.5 times the mean deep-dose rate; and at 100 cm, it approximately equaled the mean deep-dose rate. These data were valid for heavily contaminated areas, but not for lightly contaminated areas where the beta dose rates more closely paralleled the deep-dose rates at all heights.

Effect of Ground Cover on Beta Dose Rates

Cleared vs Uncleared Areas. We made a significant effort to determine the effect of the natural plant growth on the beta dose rates. Since the gamma dose rates often varied greatly between the cleared and uncleared areas, we normalized the mean beta dose rate to the respective mean deep-dose rate. After normalization, the beta dose rates in the cleared and uncleared areas were within two standard deviations of each other. However, when individual sets of sites were compared, some cleared areas had reduced beta dose rates, relative to uncleared areas, while others had increased beta dose rates. Unfortunately, the large variations in the beta dose rate that existed within small geographical areas overwhelmed the small botanical differences we were trying to measure.

Coral Gravel Ground Cover. The Marshallese traditionally place a 5- to 10-cm thick pad of coral gravel around their houses. During Phase 1 of this study, we made measurements over such areas, and also over other areas around houses. Since the gamma dose rates varied significantly between these areas, we normalized the 1-cm-height beta and shallow dose rates to the 1-cm-height deep-dose rate. After normalization, the coral gravel resulted in a reduction of 29–50% of the beta dose rate, and 20–32% of the shallow dose rate.

During Phase 2, we eliminated the effects of local dose rate variations by placing coral pads in two highly contaminated areas of Bikini. We compared the data from these sites to adjacent areas not covered with the gravel and found that the coral provides an effective absorber for beta radiation. In one area, the 1-cm beta dose rate was reduced 89%, from 1015 to 110 mrem/yr and, in the other area, the 1-cm beta dose rate was reduced 77%, from 346 to 79 mrem/yr. The shallow dose rate was reduced from 1488 to 280 mrem/yr in the most contaminated area, and from 598 to 164 mrem/yr in the other area. The 1-cm-height deep-dose rates were also reduced by about 65%, from 37 to 13 mrem/yr in one case, and from 29 to 10 mrem/yr in the other.

Conclusions

The purpose of this study was to assess the external beta dose rates relative to the gamma dose rates on Bikini and Eneu Islands. We have made no attempt in this report to evaluate the consequences of the measured dose rates, or to make any recommendations relative to cleanup or resettlement options. These matters can only be responsibly addressed by considering many factors, only one of which is the external beta and gamma dose rates.

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KJA/ka

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Appendix A: Raw Data

Table A1: A Compilation of Panasonic Data

The following corrections were applied to the data in Table A1:

1. The average of the before- and after-exposure ECFs was applied to all Panasonic data, except in cases where the before-exposure ECF varied by more than ± 25% of the before/after average. Data from these elements were elminated.

2. Five μR/hr was subtracted from E4 data affected by holders containing contaminated lead absorbers.

3. Out-of-holder Panasonic E4 data was multiplied by 1.1.

4. Data includes natural background radiation of 3.3 μR/hr.

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
1	Inside house 24	8.0	12.0	12.0	Concrete floor

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14215	13.4	14.7	14.0	6.3	12.3	12.8	12.5	2.7	1	
14216	11.8	10.3			8.1	10.9			1	IH
14213	10.6	11.7	11.1	7.2	10.2	10.4	10.3	2.0	50	
14214	8.6	8.0			7.4	10.5			50	IH
14211	9.3	12.8	11.0	22.5	8.8	9.4	9.1	4.4	100	
14212	10.0	10.1			7.2	10.6			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
3	Behind house 24	44.0	115.0	110.0	Clear; Cor w/4

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14227	88.0	91.8	89.9	3.0	104.2	98.5	101.3	4.0	1	
14228	74.0	65.9			56.6	75.5			1	IH
14225	56.2	63.2	59.7	8.3	68.1	69.2	68.6	1.2	50	
14226	61.4	51.0			49.3	74.4			50	IH
14223	50.0	57.9	53.9	10.4	63.9	62.8	63.3	1.2	100	
14224	57.4	51.5			49.2	74.4			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
4	Behind house 24	43.0	110.0	110.0	Unclear; Cor w/3

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14233	0.0	0.0	0.0	0.0	59.3	57.9	58.6	1.7	1	Dissolved
14234	0.0	0.0			41.5	59.0			1	Disolved IH
14231	68.3	62.3	65.3	6.5	66.7	65.4	66.1	1.3	50	
14232	54.5	47.7			47.2	74.5			50	IH
14229	66.4	71.5	69.0	5.2	63.3	60.3	61.8	3.4	100	
14230	47.1	45.2			48.6	74.7			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
5	Inside house 12	9.0	20.0	22.0	Concrete floor

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14239	18.2	18.4	18.3	.9	16.7	17.1	16.9	1.7	1	
14240	14.9	11.8			10.5	17.1			1	IH
14237	14.1	15.0	14.6	4.6	12.6	12.5	12.5	.9	50	
14238	13.9	11.6			10.3	12.3			50	IH
14235	12.9	13.1	13.0	.8	11.9	12.0	11.9	.9	100	
14236	11.4	9.4			9.8	12.5			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
6	Side house 12	15.0	35.0	30.0	Coral sand; Cor w/7

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14245	17.8	5.8	11.8	72.2	23.3	19.7	21.5	11.8	1	Damp
14246	0.0	0.0			16.7	20.0			1	Damp IH
14243				No Data					50	
14244	16.1	14.1			14.4	19.4			50	IH
14241	11.0	15.5	13.2	23.8	17.5	17.2	17.3	1.1	100	
14242	14.8	14.1			14.7	19.7			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
7	Side house 12	22.0	50.0	50.0	Unclear; Cor w/6

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14251	30.9	24.5	27.7	16.2	49.0	55.0	52.0	8.2	1	Damp
14252	40.5	31.3			32.0	33.2			1	IH
14249	40.3	42.0	41.2	2.9	37.7	37.3	37.5	.7	50	
14250	34.3	27.3			26.4	28.6			50	IH
14247	32.0	31.5	31.7	1.0	32.0	32.4	32.2	.9	100	
14248	28.4	23.9			24.3	28.5			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
8	Tree El68	5.5	4.5	3.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14257	7.4	8.0	7.7	5.8	5.9	6.3	6.1	4.8	1	
14258	6.6	8.4			4.7	5.1			1	IH
14255	6.5	8.9	7.7	21.8	5.0	5.1	5.1	1.5	50	
14256	7.1	5.9			4.4	4.4			50	IH
14253				No Data					100	
14254				No Data					100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
9	Inside house 5	10.0	24.0	22.0	Concrete floor

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14263	21.8	23.6	22.7	5.6	19.8	21.3	20.6	5.2	1	
14264	18.3	13.7			13.0	9.6			1	IH
14261	14.8	17.1	16.0	10.1	15.0	14.8	14.9	1.0	50	
14262	13.7	13.7			11.9	8.8			50	IH
14259	13.4	14.7	14.0	6.9	12.6	12.7	12.7	.5	100	
14260	13.2	12.1			11.2	8.8			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
10	Behind house 5	30.0	90.0	80.0	Unclear; Cor w/11

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14269	81.2	90.0	85.6	7.2	88.5	85.5	87.0	2.5	1	
14270	74.3	56.9			53.0	85.2			1	IH
14267	49.2	63.3	56.2	17.8	64.7	63.2	63.9	1.6	50	
14268	60.7	48.4			46.4	83.7			50	IH
14265	28.0	40.5	34.3	25.9	57.0	56.3	56.7	.8	100	Damp
14266	47.2	45.2			41.4	82.8			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR mete May 85	Nov 85	Site comment
11	Behind house 5	25.0	75.0	80)	Clear; Cor w/10

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14275	45.2	49.4	47.3	6.3	49.8	47.1	48.4	3.9	1	
14276	42.6	33.1			31.2	31.1			1	IH
14273	31.9	33.0	32.4	2.3	43.6	43.0	43.3	1.1	50	
14274	36.5	33.2			31.8	34.4			50	IH
14271	36.6	42.9	39.7	11.3	41.7	40.8	41.2	1.5	100	
14272	37.9	32.1			29.5	33.1			100	IH

Site	Location	PIC	μR mete May 85	Nov 85	Site comment
12	Excavation buffer	33.0	80.0	85.0	Clear-unclear Cor w/13

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14281	68.8	53.2	61.0	18.1	80.0	77.8	78.9	2.0	1	Damp
14282	58.9	42.8			43.9	37.1			1	IH
14279	26.9	33.5	30.2	15.6	56.4	55.8	56.1	.7	50	
14280	48.8	38.5			39.5	36.8			50	IH
14277	45.2	52.5	48.9	10.5	49.2	48.0	48.6	1.7	100	
14278	40.9	35.5			37.3	37.3			100	IH

Site	Location	PIC	μR mete May 85	Nov 85	Site comment
13	Excavation buffer	41.0	95.0	110 0	Unclear; Cor w/12

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14287	40.8	45.9	43.4	8.5	92.8	87.9	90.3	3.8	1	Damp
14288	73.8	43.9			56.8	58.6			1	IH HiECF
14285	41.4	62.2	51.8	28.3	70.1	69.6	69.9	.4	50	Damp HiECF
14286	69.8	54.6			49.6	47.6			50	IH
14283	51.0	51.0	51.0	.0	58.9	57.5	58.2	1.7	100	
14284	53.6	45.9			45.8	45.4			100	IH

Table A1. Raw data. Units are TLD response/hr, appr imating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indi ates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR mete May 85	Nov 5	Site comment
14	Excavation plot	12.5	35.0	40)	Clear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	4	Avg E3 E4	% Std dev	Height (cm)	Comment
14297	13.9	15.3	14.6	6.6	16.9	7.1	17.0	.8	1	
14298	13.1	11.7			13.6	1.9			1	IH
14291	8.8	9.9	9.3	8.4	16.3	5.9	16.1	1.5	50	
14292	13.5	11.6			14.3	9.8			50	IH
14289	8.5	9.7	9.1	8.7	16.4	5.4	15.9	4.6	100	
14290	12.2	10.9			15.2	0.6			100	IH

Site	Location	PIC	μR mete May 85	Nov 5	Site comment
15	Excavation plot	11.5	40.0	40)	Clear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	4	Avg E3 E4	% Std dev	Height (cm)	Comment
14303	16.0	17.6	16.8	6.5	19.8	0.8	20.3	3.4	1	
14304	15.3	12.8			14.6	9.3			1	IH
14301	6.9	7.8	7.4	8.5	14.3	4.8	14.5	2.5	50	
14302	13.4	11.3			14.1	9.7			50	IH
14299	5.4	7.8	6.6	25.4	16.4	5.7	16.1	3.2	100	
14300	13.0	11.8			14.6	0.6			100	IH

Site	Location	PIC	μR mete May 85	Nov 5	Site comment
16	Excavation plot	10.8	35.0	35.)	Clear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	4	Avg E3 E4	% Std dev	Height (cm)	Comment
14309	13.4	12.3	12.8	6.3	16.6	6.3	16.4	1.3	1	
14310	13.4	10.6			12.7	8.7			1	IH
14307	6.3	7.0	6.6	7.2	14.2	4.0	14.1	.6	50	
14308	12.7	12.1			14.0	9.7			50	IH
14305	7.4	7.0	7.2	3.3	14.2	4.4	14.3	.8	100	
14306	12.6	11.7			15.1	0.4			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
17	Excavation buffer	58.0	130.0	145.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14315	196.1	178.9	187.5	6.5	201.0	193.5	197.2	2.7	1	
14316	146.6	110.3			114.4	84.9			1	IH
14313	106.5	104.3	105.4	1.5	110.6	106.8	108.7	2.5	50	
14314	99.9	82.0			80.7	61.1			50	IH
14311	70.3	70.1	70.2	.2	84.9	83.6	84.3	1.1	100	
14312	76.6	69.0			65.2	51.7			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
18	Excavation control	19.0	60.0	70.0	60 cm step plot

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14321	9.4	10.7	10.0	8.9	18.3	18.0	18.1	1.0	1	
14322	10.4	11.4			16.6	1 .7			1	IH
14319	10.5	8.1	9.3	18.1	19.3	2 .1	19.7	3.2	50	
14320	16.1	14.3			18.2	1 .1			50	IH
14317	7.9	8.9	8.4	8.7	24.3	2 .1	24.7	2.4	100	
14318	19.4	18.4			23.1	1 .9			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
19	Excavation control	26.5	70.0	80.	30 cm step plot

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14327	21.3	23.1	22.2	5.4	33.0	34.2	33.6	2.5	1	
14328	23.6	21.2			23.7	5.7			1	IH
14325	28.2	32.0	30.1	9.1	35.6	5.3	35.5	.5	50	
14326	24.9	22.7			26.5	9.2			50	IH
14323	28.7	34.5	31.6	13.1	36.8	7.4	37.1	1.1	100	
14324	28.8	27.8			29.4	3.3			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
20	Excavation control	49.0	120.0	12?.0	Control step plot

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14333	87.8	125.0	106.4	24.7	148.4	145.6	147.0	1.4	1	
14334	137.2	99.5			92.6	53.0			1	IH
14331	71.1	84.9	78.0	12.5	90.3	87.6	89.0	2.2	50	
14332	83.5	68.8			65.6	47.9			50	IH
14329	65.7	79.0	72.3	13.1	73.0	73.8	73.4	.7	100	
14330	47.5	47.1			58.0	42.5			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
21	Tree B10	37.0	90.0	8?.0	Clear-unclear Cor w/33

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14339	46.6	23.0	34.8	47.9	69.4	66.5	67.9	3.0	1	HiECF
14340	25.4	25.3			43.9	32.9			1	IH
14337	36.9	41.0	39.0	7.4	46.2	47.8	47.0	2.5	50	
14338	43.5	40.4			37.9	29.4			50	IH
14335	40.1	39.4	39.7	1.4	43.4	43.5	43.5	.1	100	
14336	35.1	32.3			37.2	29.1			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
22	Tree B15	13.5	26.0	2?.0	Clear; Cor w/23

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14345	15.0	14.3	14.6	3.6	13.9	14.8	14.3	4.6	1	
14346	14.7	13.3			11.4	9.2			1	IH NG-ECF
14343	15.4	15.2	15.3	.8	15.0	15.1	15.0	.1	50	
14344	15.1	13.2			12.9	10.7			50	IH
14341	17.3	16.6	16.9	3.1	15.2	15.1	15.1	.4	100	
14342	16.4	14.7			13.4	11.4			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
23	Tree B15	14.0	32.0	30.0	Unclear; Cor w/22

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14351	23.5	27.4	25.4	10.9	38.6	47.1	42.8	14.0	1	
14352	20.8	16.0			18.9	15.9			1	IH
14349	22.6	23.4	23.0	2.5	20.6	20.5	20.6	.5	50	
14350	21.3	18.4			16.3	17.7			50	IH
14347	18.9	20.4	19.6	5.3	19.3	19.6	19.4	1.3	100	
14348	19.0	16.5			15.5	17.1			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
24	Tree B8	30.0	60.0	60.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14357	45.9	58.3	52.1	16.8	66.1	62.5	64.3	4.0	1	
14358	50.4	35.6			34.6	19.0			1	IH
14355	43.8	47.8	45.8	6.3	49.0	47.1	48.2	2.4	50	
14356	42.5	31.1			32.0	19.[illegible]			50	IH
14353	17.6	19.1	18.3	5.9	38.9	37.[illegible]	38.4	1.8	100	
14354	35.6	30.7			30.0	19.[illegible]			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
25	Behind house 38	13.0	28.0	35.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14363	33.6	37.2	35.4	7.1	41.5	39.8	40.6	3.0	1	
14364	24.3	20.3			21.1	12.5			1	IH
14361	24.2	26.6	25.4	6.7	28.4	28.9	28.7	1.3	50	
14362	23.7	18.4			18.5	11.7			50	IH
14359	21.0	21.6	21.3	2.0	27.1	27.0	27.1	.0	100	
14360	24.5	21.3			19.5	11.9			100	IH

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Site	Location	PIC	µR meter May 85	Nov 85	Site comment
27	Tree 21+6 trees	51.0	135.0	140.0	Unclear; Cor w/34

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14375	89.4	110.0	99.7	14.6	154.8	150.3	152.6	2.1	1	Damp
14376	108.7	83.7			82.1	92.3			1	IH
14373	86.2	99.3	92.7	10.0	95.8	94.6	95.2	.9	50	
14374	87.8	72.8			67.9	91.0			50	IH
14372	70.7	61.0			64.4	87.9			100	IH
14371				No Data					100	NG-ECF

Site	Location	PIC	µR meter May 85	Nov 85	Site comment
28	Leach Field	39.0	100.00	120.0	Clear-Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14381	52.3	86.9	69.6	35.2	104.3	96.8	100.6	5.3	1	Damp
14382	69.6	51.4			66.3	47.3			1	IH
14379	44.1	48.4	46.3	6.5	53.5	53.4	53.5	.1	50	
14380	51.7	46.5			48.8	37.9			50	IH
14377	14.7	19.7	17.2	20.8	46.9	42.6	44.7	6.8	100	
14378	43.9	41.5			44.8	35.2			100	IH

Site	Location	PIC	µR meter May 85	Nov 85	Site comment
29	Excavation control	53.0	130.0	140.0	Clear-Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14387	142.1	179.8	161.0	16.5	222.4	214.5	218.5	2.5	1	
14388	144.7	92.7			97.2	48.4			1	IH
14385	72.6	76.4	74.5	3.6	122.3	120.5	121.4	1.1	50	
14386	100.5	74.2			79.5	48.8			50	IH
14383	68.6	74.8	71.7	6.0	93.9	92.9	93.4	.7	100	
14384	79.3	73.6			70.0	47.7			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
30	Excavation control	21.0	60.0	60.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14393	26.1	29.2	27.6	8.1	33.6	34.6	34.1	2.1	1	
14394	26.5	24.4			25.5	18.5			1	IH
14391	20.5	20.2	20.4	1.0	27.2	27.8	27.5	1.4	50	
14392	19.9	19.4			22.0	16.9			50	IH
14389	21.0	21.5	21.2	1.7	25.8	25.9	25.9	.5	100	
14390	19.6	19.0			22.2	17.5			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
31	Tree B7 com well	34.0	85.0	90.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14399	68.3	82.8	75.6	13.6	84.5	84.8	84.7	.2	1	
14400	66.4	44.6			48.1	32.1			1	IH
14397	40.4	40.9	40.7	.9	54.5	53.3	53.9	1.6	50	
14398	44.4	37.5			41.1	30.3			50	IH
14395	43.1	43.9	43.5	1.3	46.7	45.4	46.0	2.1	100	
14396	39.5	35.1			37.5	28.9			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
32	NPK Plot	36.0	105.0	100.0	Clear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14405	0.0	0.0	0.0	0.0	103.9	106.8	105.3	2.0	1	Damp NG-ECF
14406	73.2	56.9			57.3	32.			1	IH
14403	68.7	80.5	74.6	11.2	72.9	73.	73.1	.3	50	
14404	62.0	51.3			48.6	32.			50	IH
14401	52.6	67.2	59.9	17.2	63.2	63.	63.4	.4	100	
14402	52.0	49.4			46.3	32.			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
33	Tree B10	31.0	80.0	85.0	Unclear; Cor w/21

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14411	0.0	0.0	0.0	0.0	45.3	45.8	45.6	.7	1	Dslvd NG-ECF
14412	0.0	15.3			31.2	23.4			1	IH Wet NGECF
14409	34.4	36.8	35.6	4.8	39.2	38.2	38.7	1.8	50	
14410	33.4	33.7			33.7	25.8			50	IH
14407	31.0	35.2	33.1	8.9	37.0	36.7	36.8	.5	100	
14408	35.8	31.0			32.6	26.4			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
34	Trees 21+6 trees	50.0	130.0	140.0	Clear-Unclear Cor w/27

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14417	91.4	113.0	102.2	15.0	147.5	152.6	150.0	2.4	1	Damp
14418	107.1	85.2			86.0	55.8			1	IH
14415	77.8	76.1	77.0	1.5	93.9	93.7	93.8	.2	50	
14416	86.8	72.1			64.0	46.0			50	IH
14413	67.0	76.7	71.8	9.6	73.7	74.2	74.0	.5	100	
14414	72.6	65.4			59.4	45.7			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
35	Leach field road	38.0	100.00	80.0	Clear; Cor w/36 B3

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14423	122.9	137.1	130.0	7.8	125.1	114.6	119.9	6.2	1	
14424	109.1	80.9			66.8	37.8			1	IH
14421	67.8	57.0	62.4	12.3	70.7	71.5	71.1	.7	50	
14422	67.7	51.7			50.4	33.9			50	IH
14419	31.9	41.1	36.5	17.9	61.7	61.3	61.5	.5	100	
14420	52.2	48.0			49.4	36.3			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
36	Leach field road	35.0	90.0	80.0	Unclear; Cor w/35 B4

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14429	73.4	76.1	74.8	2.6	72.3	77.1	74.7	4.6	1	
14430	62.4	49.8			47.1	34.2			1	IH
14427	62.2	58.9	60.6	3.9	59.4	58.7	59.1	.9	50	
14428	54.8	41.5			42.7	31.9			50	IH
14425	25.5	43.2	34.4	36.4	50.1	48.6	49.3	2.2	100	
14426	46.3	40.8			39.7	31.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
37	Side house 32	13.5	30.0	35.0	Crushed coral gravel

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14435	20.7	18.3	19.5	8.9	17.8	16.0	16.9	7.7	1	
14436	13.6	11.5			11.2	9.0			1	IH
14433	10.1	8.2	9.2	14.7	14.9	15.6	15.2	3.3	50	
14434	14.3	13.3			12.6	10.7			50	IH
14431	15.7	17.9	16.8	9.3	15.7	16.3	16.0	2.7	100	
14432	14.0	14.2			13.9	11.6			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
40	House 32 lagoon	15.0	32.0	35.0	Coral sand

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14453	20.6	23.1	21.9	8.2	22.4	22.4	22.4	.1	1	
14454	17.4	18.2			15.5	13.1			1	IH
14451	19.0	19.4	19.2	1.7	20.3	20.4	20.4	.2	50	
14452	20.8	16.6			15.2	12.5			50	IH
14449	16.2	16.1	16.2	.2	19.3	19.5	19.4	.8	100	
14450	19.9	18.0			16.1	13.4			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
41	Side house 5	13.8	35.0	30.0	Crshd coral gravl Cor w/10 11

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14459	13.7	14.4	14.1	3.6	14.1	14.2	14.2	.1	1	
14460	12.6	10.8			11.3	9.3			1	IH
14457	13.3	13.9	13.6	2.9	15.3	15.5	15.5	1.7	50	
14458	14.3	12.6			12.6	10.6			50	IH
14455	12.1	14.2	13.1	11.3	16.7	16.1	16.4	2.5	100	
14456	15.5	14.0			13.8	11.8			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
42	Tree E1	7.5	10.0	10.0	Clear-unclear Cor w/43

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14465	10.6	11.5	11.0	6.0	10.2	10.8	10.5	3.8	1	
14466	9.7	9.6			7.1	5.7			1	IH
14463	9.0	9.2	9.1	1.6	7.7	8.4	8.0	6.7	50	
14464	8.9	10.1			6.4	6.1			50	IH
14461	8.8	11.4	10.1	18.0	7.7	7.4	7.6	3.1	100	
14462	8.8	7.9			6.6	6.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
43	Tree E1	7.5	10.0	10.0	Unclear; Cor w/42

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14472	0.0	8.2			6.9	5.9			1	IH Wet
14471	0.0	0.0	0.0	0.0	9.2	8.7	8.9	4.2	1	Wet NG-ECF
14469	9.6	11.5	10.6	12.9	8.6	8.7	8.6	.6	50	
14470	9.6	9.7			7.0	6.6			50	IH
14467	8.9	10.8	9.8	13.2	7.4	7.5	7.4	1.2	100	
14468	9.2	9.0			6.8	6.5			100	IH

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Site	Location	PIC	μR meter May 85	Nov 85	Site comment
44	Tree E125	6.3	6.0	8.0	Clear; Cor w/45

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14477	6.8	6.4	6.6	5.2	6.5	6.8	6.6	3.4	1	HiECF
14478	7.4	7.0			5.5	5.5			1	IH
14475	7.6	7.5	7.5	.5	6.2	6.6	6.4	4.6	50	
14476	6.9	7.8			5.7	6.0			50	IH
14473	7.4	8.2	7.8	7.4	6.0	6.1	6.1	.6	100	
14474	7.1	7.2			5.4	6.3			100	IH

Site	Location	PIC	μR meter May 85	Nov 85	Site comment
45	Tree E125	6.3	7.5	8.0	Unclear; Cor w/44

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14483	6.9	7.1	7.0	2.0	7.3	7.2	7.3	1.3	1	
14484	8.1	7.7			6.8	5.8			1	IH
14481	6.9	9.5	8.2	21.9	6.6	6.8	6.7	2.4	50	
14482	7.0	7.7			5.7	6.0			50	IH
14479	6.6	8.2	7.4	15.9	6.2	6.3	6.3	1.2	100	
14480	6.7	7.0			5.5	8.1			100	IH

Site	Location	PIC	μR meter May 85	Nov 85	Site comment
46	Tree E109	6.0	4.5	3.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14489	5.5	4.8	5.2	9.2	6.1	6.4	6.3	3.3	1	
14490	7.4	6.9			5.1	5.0			1	IH
14487	7.6	7.6	7.6	.1	5.5	5.5	5.5	.2	50	
14488	6.7	9.0			4.7	5.2			50	IH
14485	7.0	7.7	7.3	7.2	5.5	5.6	5.5	1.5	100	
14486	7.1	5.4			4.5	4.7			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
47	Tree E111	4.7	3.0	2.5	Clear; Cor w/48

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14495	6.2	7.7	6.9	15.5	5.0	5.0	5.0	.6	1	
14496	6.7	6.1			4.1	4.2			1	IH
14493	3.9	5.3	4.6	21.8	4.4	4.8	4.6	5.8	50	
14494	5.5	6.3			4.0	4.2			50	IH
14491	6.0	6.0	6.0	.2	4.3	4.3	4.3	.1	100	
14492	6.1	6.6			4.2	4.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
48	Tree E111	4.7	2.0	2.5	Unclear; Cor w/47

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14501	5.1	6.3	5.7	14.9	4.7	4.9	4.8	2.0	1	
14502	6.9	6.0			3.9	4.1			1	IH
14499	8.0	9.0	8.5	8.7	4.5	4.7	4.6	3.2	50	
14500	6.5	6.6			4.3	4.2			50	IH
14497	6.8	7.4	7.1	5.9	4.4	4.3	4.3	1.1	100	
14498	5.6	6.9			3.8	4.4			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
49	Tree E112	5.0	3.0	2.5	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14507	5.4	4.2	4.8	17.9	5.0	5.1	5.0	.9	1	
14508	5.5	7.3			4.2	4.3			1	IH
14505	6.8	8.1	7.5	12.8	4.4	4.6	4.5	3.1	50	
14506	6.2	5.8			3.9	3.9			50	IH
14503	6.8	6.3	6.5	4.8	4.3	4.5	4.4	3.3	100	
14504	5.8	6.2			3.8	4.2			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
50	Tree E113	4.4	2.5	2.5	Clear-unclear; Cor w/51

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14513	4.3	4.6	4.4	4.7	4.3	4.7	4.5	5.6	1	Damp
14514	5.5	5.5			3.7	3.8			1	IH
14511	6.7	6.2	6.4	5.6	4.1	4.4	4.3	4.3	50	
14512	5.3	5.8			3.8	4.3			50	IH
14509	7.4	7.5	7.5	.7	4.1	4.3	4.2	2.5	100	
14510	6.6	6.1			3.8	4.1			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
51	Tree E113	4.4	2.5	2.5	Unclear; Cor w/50

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14520	4.9	5.7			4.0	4.1			1	IH
14519	0.0	0.0	0.0	0.0	5.1	5.4	5.3	4.7	1	NG-ECF
14517	7.2	7.3	7.2	1.0	4.7	4.9	4.8	3.6	50	
14518	6.1	5.9			3.8	4.9			50	IH
14515	8.4	7.4	7.9	9.0	4.5	5.5	5.0	15.0	100	
14516	5.6	5.5			4.0	4.9			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
52	Tree E114	4.7	4.0	3.0	Clear; Cor w/53

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14525	9.6	9.7	9.7	.4	5.3	5.4	5.4	1.3	1	
14526	6.9	6.2			4.3	4.3			1	IH
14523	7.0	6.0	6.5	10.4	4.7	5.3	5.3	15.4	50	
14524	7.0	6.0			4.5	4.3			50	IH
14521	6.3	7.1	6.7	8.8	4.6	4.8	4.7	3.4	100	
14522	6.2	6.7			4.4	4.7			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
53	Tree E114	4.7	3.5	3.0	Unclear; Cor w/52

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14532	3.9	4.9			4.6	4.8			1	IH; Wet
14531	0.0	0.0	0.0	0.0	6.2	6.1	6.2	1.4	1	Wet NG-ECF
14529	7.2	7.5	7.4	2.8	5.5	5.7	5.6	2.5	50	
14530	5.8	6.3			4.7	5.0			50	IH
14527	7.5	7.8	7.6	2.3	4.6	5.3	5.0	9.0	100	
14528	6.1	7.2			4.5	4.5			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
54	Tree E115	6.0	4.0	5.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14537	6.4	7.5	6.9	10.6	7.0	6.9	7.0	1.5	1	
14538	8.6	7.6			5.3	5.3			1	IH
14535	6.2	6.4	6.3	2.2	5.6	6.0	5.8	4.6	50	
14536	7.1	6.9			4.7	5.0			50	IH
14533	8.4	7.9	8.2	4.1	5.4	5.7	5.6	3.5	100	
14534	6.2	6.9			4.8	5.1			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
55	Tree E14	6.4	6.0	5.1	Clear; Cor w/56

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14543	9.2	9.3	9.3	.6	7.5	7.4	7.4	.8	1	
14544	7.1	7.5			5.3	5.0			1	IH
14541	8.2	9.0	8.6	6.4	6.4	6.9	6.6	5.7	50	
14542	6.9	7.8			5.3	5.3			50	IH
14539	7.3	8.6	8.0	11.3	6.1	6.4	6.3	4.0	100	
14540	7.2	7.1			5.2	5.3			100	IH

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Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
56	Tree E14	6.4	6.0	5.[illegible]	Unclear; Cor w/55

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14549	7.1	8.2	7.7	10.5	7.7	7.9	7.8	1.1	1	
14550	7.5	7.6			5.9	5.6			1	IH
14547	7.1	8.1	7.6	9.1	6.5	6.8	6.7	2.3	50	
14548	8.4	7.6			5.5	5.4			50	IH
14545	7.5	9.4	8.5	16.3	5.8	6.3	6.0	6.4	100	
14546	8.0	7.5			5.6	6.6			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
57	Tree E141	5.0	3.0	2.5	Clear; Cor w/58

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14555	6.0	6.9	6.5	9.5	5.7	6.2	6.0	6.6	1	
14556	6.2	7.7			4.3	4.4			1	IH
14553	6.8	6.2	6.5	6.4	5.0	5.3	5.4	10.3	50	
14554	5.9	6.3			4.6	4.3			50	IH
14551	6.7	7.0	6.8	2.9	4.6	5.7	5.1	14.8	100	
14552	5.4	6.5			4.3	4.?			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
58	Tree E141	5.0	3.0	2.5	Unclear Cor w/57

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14561	7.4	8.0	7.7	4.6	6.1	7.3	6.7	12.3	1	
14562	7.6	6.4			4.5	4.1			1	IH
14559	7.3	6.5	6.9	8.0	5.1	6.2	5.6	13.3	50	
14560	6.4	6.3			4.3	4.3			50	IH
14557	7.2	7.8	7.5	5.7	5.0	6.0	5.5	13.0	100	
14558	4.3	3.7			4.2	4.3			100	IH HiECF

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
59	Tree E15	6.5	4.5	4.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14567	3.8	6.7	5.3	39.6	8.7	9.6	9.1	7.2	1	Damp
14568	7.1	7.7			5.8	5.0			1	IH
14565	8.7	10.0	9.4	9.8	6.4	7.7	7.0	13.7	50	
14566	9.1	7.0			5.3	5.3			50	IH
14563	7.1	9.2	8.2	18.6	5.8	7.0	6.4	12.6	100	
14564	7.1	6.7			5.1	5.4			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
60	Tree E119	5.4	3.0	3.5	Clear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14573	5.0	5.6	5.3	6.9	5.0	5.8	5.4	10.1	1	
14574	6.2	6.5			4.3	4.3			1	IH
14571	6.8	7.7	7.3	8.2	4.5	5.8	5.2	16.9	50	
14572	5.9	6.0			4.2	4.6			50	IH
14569	5.8	5.6	5.7	2.0	4.4	5.2	4.8	12.4	100	
14570	5.5	5.0			4.2	4.9			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
61	Tree E135	12.5	22.0	23.0	Clear-unclear Cor w/62 B6

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14580	24.6	14.9			16.3	15.8			1	IH
14579				NO DATA					1	NG-ECF
14577	14.0	19.0	16.5	21.6	16.3	16.8	16.6	1.9	50	
14578	16.3	15.1			12.5	16.0			50	IH
14575	15.1	16.0	15.6	4.4	14.2	14.7	14.4	2.2	100	
14576	14.2	13.2			11.3	14.7			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 8	Site comment
62	Tree E135	12.5	18.0	26.(	Unclear; Cor w/61 B7

TLD	E1	E2	Avg E1 E2	% Std dev	E3	4	Avg E3 E4	% Std dev	Height (cm)	Comment
14585	13.1	17.5	15.3	20.4	21.9	1.2	21.6	2.3	1	
14586	16.7	16.1			15.1	6.4			1	IH
14583	15.6	20.4	18.0	18.9	18.4	9.1	18.7	2.6	50	
14584	18.0	16.3			13.1	6.6			50	IH
14581	15.8	15.6	15.7	.9	15.0	5.9	15.5	4.2	100	
14582	17.4	15.3			12.5	5.7			100	IH

Site	Location	PIC	μR mete May 85	μR mete Nov 85	Site comment
63	Tree E169	5.0	3.5	4.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14591	7.0	7.3	7.2	2.9	6.2	7.3	6.8	11.3	1	HiECF
14592	7.8	6.9			5.1	5.5			1	IH
14589	6.7	7.2	6.9	5.6	5.0	6.2	5.6	14.3	50	
14590	5.8	6.9			4.6	4.4			50	IH
14587	8.1	8.8	8.5	6.5	5.1	6.2	5.6	14.4	100	
14588	7.5	6.9			4.8	5.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
64	Tree E12	5.2	3.5	3.0	Clear; Cor w/65

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14597	5.4	5.8	5.6	4.7	5.6	7.6	6.6	21.5	1	
14598	6.2	6.5			4.1	4.4			1	IH
14595	6.2	7.6	6.9	14.2	4.9	5.7	5.3	10.8	50	
14596	8.1	5.7			4.1	4.7			50	IH
14593	6.8	6.3	6.5	5.9	4.6	5.4	5.0	10.2	100	
14594	5.7	6.0			4.3	4.8			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
65	Tree E12	5.2	2.8	3.[illegible]	Unclear; Cor w/64

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14603	4.5	4.1	4.3	5.8	5.3	5.8	5.5	6.3	1	
14604	5.4	5.2			4.4	4.2			1	IH
14601	6.0	6.8	6.4	8.9	4.7	4.8	4.8	1.7	50	
14602	8.0	6.8			4.1	4.4			50	IH
14599	7.3	8.9	8.1	14.0	4.6	5.6	5.1	13.9	65	
14600	6.2	6.9			4.3	4.5			65	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
66	Tree E5	7.0	8.0	7.[illegible]	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14609	9.2	9.1	9.2	.4	8.4	8.3	8.3	.9	1	
14610	8.9	8.1			5.9	5.7			1	IH
14607	9.2	9.0	9.1	1.6	7.0	7.2	7.1	2.1	50	
14608	8.2	7.6			6.2	6.1			50	IH
14605	8.3	8.9	8.6	4.9	6.8	6.8	6.8	.1	100	
14606	8.0	7.9			6.2	6.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
67	Tree E181	6.0	6.0	7.[illegible]	Clear; Cor w/68

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14615	9.2	8.3	8.8	7.0	7.8	7.6	7.7	1.8	1	
14616	8.5	8.3			5.6	5.5			1	IH
14613	5.2	5.8	5.5	8.3	6.6	6.3	6.5	2.7	50	
14614	7.9	6.9			5.6	5.4			50	IH
14611	7.8	8.4	8.1	5.1	6.1	5.8	6.0	3.4	100	
14612	0.0	3.8			4.9	5.7			100	IH NG-ECF

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	Nov 85	Site comment
68	Tree E181	6.0	6.0	7.	Unclear; Cor w/67

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14621	9.4	9.8	9.6	2.9	8.3	8.5	8.4	1.6	1	
14622	8.9	8.0			6.0	5.8			1	IH
14619	9.2	9.5	9.4	2.2	6.7	6.7	6.7	.4	50	
14620	7.1	7.1			5.5	4.6			50	IH
14617	8.5	8.5	8.5	.2	5.9	6.3	6.1	4.1	100	
14618	7.6	6.9			5.4	5.2			100	IH

Site	Location	PIC	μR meter May 85	Nov 85	Site comment
69	Tree E186	4.4	3.5	2	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14627	5.8	6.3	6.0	5.0	5.1	5.1	5.1	1.0	1	
14628	6.4	5.7			4.4	4.6			1	IH
14625	6.1	6.7	6.4	7.1	4.4	4.8	4.6	7.0	50	
14626	6.1	6.8			4.0	4.2			50	IH
14623	6.4	7.1	6.8	8.0	4.2	5.2	4.7	15.0	100	
14624	5.8	5.6			4.2	4.3			100	IH

Site	Location	PIC	μR meter May 85	Nov 85	Site comment
70	Tree E54	7.5	10.0	11.0	Clear; Cor w/71

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14633	10.4	12.7	11.5	13.9	12.2	12.0	12.1	1.2	1	
14634	10.4	9.9			8.0	6.8			1	IH
14631	10.7	10.4	10.6	2.2	8.9	9.4	9.2	3.7	50	
14632	11.0	9.5			7.5	6.8			50	IH
14629	9.0	9.6	9.3	4.5	7.7	7.8	7.8	.9	100	
14630	8.6	7.8			7.1	6.4			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
71	Tree E54	7.5	10.0	1[illegible].0	Unclear; Cor w/70

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14639	10.0	11.1	10.5	6.9	10.2	[illegible]0.0	10.1	1.4	1	
14640	11.5	9.8			7.6	6.7			1	IH
14637	10.8	10.5	10.7	2.2	8.6	8.9	8.8	2.6	50	
14638	10.0	9.3			7.3	6.4			50	IH
14635	10.8	11.0	10.9	1.1	7.6	8.1	7.9	5.2	100	
14636	8.6	8.9			7.0	6.6			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
72	Tree E37	5.5	5.5	5[illegible]	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14645	5.2	7.0	6.1	21.7	6.2	6.5	6.3	2.8	1	
14646	7.0	7.5			5.0	5.0			1	IH
14643	8.0	8.0	8.0	.1	5.8	5.9	5.8	.1	50	
14644	6.8	6.4			4.9	4.9			50	IH
14641	7.5	8.2	7.8	6.9	5.8	5.9	5.8	1.7	100	
14642	7.4	7.2			4.8	5.2			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
73	Tree E38	8.0	13.0	1[illegible].0	Clear; Cor w/74

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14651	7.4	10.8	9.1	26.6	9.9	10.8	10.3	6.0	1	
14652	10.4	10.4			8.6	7.8			1	IH
14649	11.0	12.0	11.5	6.2	9.6	9.9	9.7	2.0	50	
14650	11.9	9.8			8.4	7.3			50	IH
14647	10.3	8.3	9.3	14.9	9.4	9.1	9.3	2.2	100	
14648	10.2	9.2			7.9	6.9			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
74	Tree E38	8.0	13.0	12.0	Unclear; Cor w/73

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14657	8.6	9.6	9.1	7.3	12.3	11.5	11.9	4.6	1	
14658	9.9	8.5			7.6	7.0			1	IH
14655	8.8	10.6	9.7	12.9	8.8	9.7	9.2	6.9	50	
14656	9.8	9.9			7.5	6.9			50	IH
14653	9.5	9.9	9.7	3.1	8.3	8.9	8.6	4.4	100	
14654	10.6	9.2			7.4	6.0			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
75	Tree E184	8.6	12.0	14.0	Unclear Cor w/73

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14663	11.3	13.4	12.4	12.3	11.8	12.7	12.3	5.5	1	
14664	10.7	10.2			7.8	7.1			1	IH
14661	11.8	12.0	11.9	1.4	10.2	10.9	10.6	4.8	50	
14662	11.5	10.6			7.8	7.1			50	IH
14659	11.2	12.1	11.6	5.6	9.4	10.2	9.8	5.5	100	
14660	10.5	10.1			8.1	7.4			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
76	Tree E10	10.0	15.0	18.0	Clear; Cor w/77 B9

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14669	17.0	21.4	19.2	16.4	18.0	20.8	19.4	10.2	1	
14670	18.8	11.9			11.2	12.3			1	IH
14667	17.0	16.0	16.5	4.1	13.4	14.4	13.9	4.8	50	
14668	14.7	12.7			10.4	13.6			50	IH
14665	14.0	13.8	13.9	1.1	11.2	12.3	11.8	6.5	100	
14666	11.4	12.4			9.5	13.7			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
77	Tree E10	10.0	18.0	18.0	Unclear; Cor w/76

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14675	11.9	11.2	11.6	4.1	18.1	19.0	18.5	3.5	1	
14676	13.7	11.6			12.6	11.0			1	IH
14673	14.2	15.5	14.8	5.8	14.5	14.9	14.7	2.1	50	HiECF
14674	14.8	12.3			11.0	9.6			50	IH
14671	15.8	14.1	15.0	8.1	13.0	13.3	13.1	1.5	100	
14672	12.3	12.7			10.4	9.3			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
78	Tree E190	7.8	10.0	12.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14681	11.0	13.7	12.4	15.6	10.6	10.9	10.8	1.6	1	
14682	9.3	7.7			7.5	6.1			1	IH
14679	9.1	8.4	8.7	5.5	8.3	9.1	8.7	6.5	50	
14680	7.3	7.1			6.9	6.8			50	IH
14677	8.6	10.1	9.4	10.9	8.2	8.5	8.4	2.6	100	
14678	0.0	0.0			4.9	4.7			100	IH Wet NGECF

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
79	Tree E174	5.7	5.0	3.0	Clear; Cor w/80

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14687	3.0	5.1	4.1	36.8	5.4	6.4	5.9	12.0	1	
14688	4.4	5.9			4.6	4.9			1	IH
14685	6.0	6.3	6.1	3.0	4.9	5.3	5.1	5.3	50	
14686	5.2	4.7			4.6	4.6			50	IH
14683	7.7	9.2	8.5	11.9	5.1	5.2	5.2	1.4	100	
14684	5.0	6.7			4.7	4.9			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
80	Tree E174	5.7	5.0	3.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14693	4.5	5.4	4.9	12.5	5.7	6.7	6.2	11.4	1	
14694	6.4	6.1			4.9	6.5			1	IH
14691	6.6	8.4	7.5	17.4	5.5	6.3	5.9	9.6	50	
14692	6.6	7.2			4.9	6.8			50	IH
14689	6.7	6.7	6.7	.4	5.2	6.0	5.6	10.1	100	
14690	6.2	6.4			4.6	6.6			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
81	Tree E175	5.3	6.0	4.5	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14699	9.0	9.4	9.2	2.9	7.4	7.8	7.6	4.0	1	
14700	8.2	7.5			5.3	5.4			1	IH
14697	7.7	8.6	8.1	8.0	5.8	6.5	6.2	8.7	50	
14698	6.9	7.3			5.4	5.5			50	IH
14695	6.5	8.4	7.5	17.6	5.8	6.1	6.0	3.5	100	
14696	5.6	5.5			5.1	4.9			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
82	Tree E178	6.4	8.0	8.0	Clear; Cor w/83

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14705	8.6	9.7	9.1	8.4	7.5	7.5	7.5	.1	1	
14706	8.4	7.7			5.8	5.8			1	IH
14703	8.8	9.8	9.3	8.1	6.5	6.8	6.6	3.7	50	
14704	6.4	7.2			5.8	5.5			50	IH
14701	8.5	7.4	8.0	9.3	6.8	6.5	6.6	2.5	100	
14702	7.3	7.4			5.6	5.6			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
83	Tree E178	6.4	8.0	8.3	Unclear; Cor w/82

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14711	5.9	7.8	6.9	19.4	7.4	7.3	7.4	.5	1	
14712	8.2	7.8			5.6	5.4			1	IH
14709	7.2	9.0	8.1	15.8	6.6	7.1	6.9	4.7	50	
14710	6.5	7.4			5.9	5.6			50	IH
14707	8.5	8.3	8.4	1.4	6.6	6.5	6.6	.9	100	
14708	7.2	7.2			5.5	5.8			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
84	Tree E34	6.5	5.0	6.0	Unclear Cor w/85

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14717	9.9	12.4	11.2	15.7	9.0	8.4	8.7	4.5	1	
14718	9.9	8.9			6.4	5.4			1	IH
14715	8.2	8.3	8.3	.8	6.5	6.7	6.6	1.5	50	
14716	8.6	6.5			5.7	5.5			50	IH
14713	9.9	7.3	8.6	21.1	6.3	6.5	6.4	2.6	100	
14714				No Data					100	IH NG-ECF

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
85	Tree E34	6.5	6.0	6.0	Unclear Cor w/84

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14723	8.0	10.0	9.0	15.5	9.0	9.1	9.1	.6	1	
14724	6.9	2.5			6.6	6.5			1	IH HiECF
14721	6.6	8.2	7.4	15.4	6.7	6.9	6.8	2.3	50	
14722	7.1	7.1			5.4	5.5			50	IH
14719	8.3	7.0	7.6	12.3	6.5	6.3	6.4	2.5	100	
14720	6.6	6.8			5.7	5.4			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
87	Tree E23	10.0	15.0	15.0	Clear-unclear Cor w/88

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14735	15.1	17.3	16.2	9.9	15.6	16.4	16.0	3.3	1	
14736	15.2	12.1			10.0	7.9			1	IH
14733	11.9	12.3	12.1	2.1	11.2	11.0	11.1	1.2	50	
14734	11.5	10.8			9.2	7.9			50	IH
14731	11.6	11.8	11.7	1.3	10.3	10.7	10.5	2.6	100	
14732	10.4	9.5			8.9	8.0			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
88	Tree E23	10.0	15.0	15.0	Unclear Cor w/87

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14741	9.4	13.3	11.4	24.3	15.7	15.5	15.6	.8	1	
14742	10.6	9.6			10.6	9.2			1	IH
14739	10.3	12.6	11.5	14.2	11.2	10.8	11.0	2.1	50	
14740	11.1	12.1			9.3	8.5			50	IH
14737	12.1	12.0	12.1	.6	10.6	10.8	10.7	1.7	100	
14738	10.5	11.3			9.5	8.0			100	IH

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
89	Tree E17A	5.2	5.0	6.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14747	0.0	0.0	0.0	0.0	6.0	6.0	6.0	.2	1	Wet NG-ECF
14748	5.7	3.7			4.8	4.6			1	IH
14745	6.6	7.8	7.2	12.2	5.7	5.8	5.7	1.5	50	
14746	8.8	6.6			4.9	4.8			50	IH
14743	6.5	7.8	7.1	13.4	5.5	5.8	5.7	4.0	100	
14744	7.3	6.9			4.8	4.9			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
90	Tree E165	6.2	6.5	5.	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14753	6.9	7.8	7.3	7.8	5.9	6.4	6.1	5.3	1	
14754	8.7	8.1			5.8	5.4			1	IH
14751	6.5	8.7	7.6	20.4	7.6	7.3	7.4	2.9	50	
14752	5.6	6.2			5.5	5.4			50	IH
14749	8.7	7.2	8.0	13.5	6.1	5.9	6.0	2.8	100	
14750	8.3	7.4			5.6	6.5			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
100	Tree B3	130.0	12[illegible]0	Unclear Cor w/111

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
16403	168.0	197.6	182.8	11.5	171.4	1[illegible]3.5	172.4	.9	1	
02910	156.4	96.6			89.2	[illegible]8.9			1	IH
15864	101.8	99.1	100.5	1.9	110.0	1[illegible]1.0	110.5	.6	50	
02213	103.4	83.6			72.7	[illegible]1.9			50	IH
08564	78.2	81.3	79.7	2.8	83.2	[illegible]6.3	84.7	2.5	100	
07717	77.7	67.7			65.7	[illegible]3.0			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
101	Tree B4	100.00	100	Clear Cor w/102

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
07965	122.8	128.1	125.4	3.0	120.0	1[illegible]7.5	123.8	4.3	1	
17287	106.4	80.6			70.4	[illegible]7.1			1	IH
10086	75.3	75.9	75.6	.6	77.6	[illegible]0.6	79.1	2.7	50	
11051	72.3	54.8			56.2	[illegible]6.3			50	IH
08624	64.6	60.8	62.7	4.3	68.2	[illegible]9.4	68.8	1.2	100	
09607	56.9	51.5			51.2	[illegible]0.4			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
102	Tree B4	100.0	110.0	Uncleared Cor w/101

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
16387	0.0	0.0	0.0	0.0	88.0	87.6	87.8	.4	1	Wet
15625	52.5	41.7			57.7	50.4			1	IH Damp
05187	0.0	0.0	0.0	0.0	77.1	76.6	76.8	.5	50	
07738	72.3	61.2			56.3	49.2			50	IH
01480	61.4	62.6	62.0	1.4	62.8	63.3	63.6	1.7	100	
07820	56.9	49.0			50.1	49.2			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
103	End of Isle	22.0	24.0	Unclear

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
05023	16.5	16.5	16.5	.0	17.0	17.7	17.3	3.1	1	
01278	16.6	13.3			12.5	12.0			1	IH
08454	11.9	14.9	13.4	16.2	14.4	15.7	15.1	6.3	50	
13074	13.8	13.7			12.6	10.7			50	IH
02435	13.6	12.3	13.0	7.2	15.0	15.4	15.2	2.1	100	
09080	13.6	13.2			12.9	12.4			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
104	Behind house 32	33.0	30.0	Cleared, Cor w/37

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
06859	24.9	29.0	27.0	10.8	25.3	28.9	27.1	9.2	1	
00250	20.0	16.7			16.4	11.3			1	IH
00949	13.9	18.4	16.1	19.8	21.3	21.8	21.6	1.6	50	
02581	18.7	14.9			15.7	11.5			50	IH
01984	14.7	19.9	17.3	21.3	19.6	20.6	20.1	3.5	100	
06720	18.9	17.0			16.9	14.2			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
105	Tree B21	130.0	130.0	Uncleared Cor w/106, 107

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
08293	129.4	155.2	142.3	12.8	143.8	50.5	147.2	3.2	1	Damp
03348	128.7	82.4			81.3	55.7			1	IH
03612	81.6	95.3	88.5	11.0	110.2	11.1	110.7	.5	50	
08183	82.3	67.5			74.3	55.4			50	IH
03012	89.5	92.0	90.8	1.9	84.2	84.7	84.4	.3	100	
16505	78.7	64.4			68.5	53.3			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
106	Tree B21	120.0	115.0	Clear Cor w/105 107 B10

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
11071	72.2	74.3	73.3	2.0	86.5	86.3	86.4	.2	1	
16333	76.2	59.3			61.5	50.3			1	IH
01976	38.7	51.8	45.3	20.6	77.8	79.5	78.7	1.5	50	
00837	63.8	53.6			57.0	42.6			50	IH
02073	36.3	38.9	37.6	5.0	69.2	71.2	70.2	2.0	100	
07410	59.9	55.8			53.7	44.1			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
107	Tree B21	100.0	93.0	Crushed Coral Cor w/105, 106

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
02330	29.3	26.5	27.9	7.1	31.8	32.3	32.1	1.2	1	
00830	27.4	24.5			28.0	22.2			1	IH
06943	15.6	24.7	20.2	31.9	45.0	47.1	46.1	3.2	50	
02883	42.4	40.5			38.0	31.5			50	IH
16547	23.6	24.0	23.8	1.1	53.1	51.0	52.1	2.8	100	
00473	48.4	43.4			44.3	36.3			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
108	Tree B10	90.0	95.0	Unclear, Cor w/109, 110

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
02350	70.0	66.3	68.1	3.9	74.3	75 7	75.0	1.3	1	Damp
02802	61.8	52.2			54.3	43 7			1	IH Damp
00965	46.3	48.8	47.5	3.8	48.4	49 5	49.0	1.6	50	
02371	44.8	41.8			42.1	33 4			50	IH
09775	39.6	40.2	39.9	1.1	45.1	46 6	45.8	2.2	100	
08225	40.7	40.8			39.7	31 9			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
109	Tree B10	75.0	80.0	Crushed Coral, Cor w/108, 110

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
15620	20.3	21.1	20.7	2.9	22.8	25.3	24.1	7.2	1	
07876	17.1	18.5			20.5	16.9			1	IH
02735	27.5	28.2	27.8	1.8	30.2	31.9	31.1	3.8	50	
04879	26.7	27.3			28.3	26.8			50	IH
04816	21.3	21.7	21.5	1.5	35.5	35.7	35.6	.4	100	
09450	28.6	28.0			33.1	27.7			100	IH

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
110	Tree B10	80.0	85.0	Cleared, Cor w/108, 109

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
11063	77.2	80.6	78.9	3.0	77.3	81 0	79.1	3.3	1	
04085	67.1	50.0			49.6	32 6			1	IH
09076	49.4	49.8	49.6	.5	52.2	55 7	54.0	4.5	50	
08601	43.7	39.1			42.7	31 4			50	IH
06960	36.1	38.9	37.5	5.3	47.2	48 6	47.9	2.1	100	
03624	42.7	36.6			37.1	29 3			100	IH

Table A1. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. "IH" indicates an In-Holder TLD exposure. PIC and μR meter readings are in units of μR/hr and were taken 100 cm from the ground.

Site	Location	μR meter May 85	μR meter Nov 85	Site comment
111	Tree B3	80.0	85.0	Cleared Cor w/100

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
03389	25.8	20.8	23.3	15.1	33.8	33.9	33.8	.2	1	
03810	28.4	23.5			25.7	30.1			1	IH
04780	24.3	19.0	21.7	17.4	36.2	38.4	37.3	4.1	50	
02942	33.6	27.9			30.6	35.5			50	IH
02985	15.4	16.5	16.0	5.1	39.2	40.3	39.7	2.0	100	
03915	35.9	32.1			33.0	38.6			100	IH

Appendix A: Raw Data

Table A2: Beta Spectrometer Arrays

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B1	Tree B21+6 Trees	51.0	135.0	140.0	Unclear, Cor w/27, 34

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14765	73.3	64.6	68.9	8.9	129.5	131.1	130.3	.9	1	14 mg/cm2
14766	56.0	72.9	64.5	18.5	124.7	124.9	124.8	.1	1	21 mg/cm2
14767	83.2	101.0	92.1	13.6	110.2	108.3	109.2	1.2	1	48 mg/cm2
14768	71.5	84.6	78.0	11.8	97.6	96.6	97.1	.7	1	84 mg/cm2
14769	59.7	61.7	60.7	2.3	72.1	71.9	72.0	.1	1	233 mg/cm2
14760	79.1	85.6	82.4	5.6	84.8	84.3	84.6	.5	50	14 mg/cm2
14761	79.1	93.7	86.4	11.9	84.1	86.6	85.3	2.1	50	21 mg/cm2
14762	75.1	79.8	77.5	4.3	79.5	79.0	79.3	.4	50	48 mg/cm2
14763	61.3	74.2	67.7	13.5	73.1	73.9	73.5	.8	50	84 mg/cm2
14764	51.1	56.1	53.6	6.6	61.1	61.5	61.3	.5	50	233 mg/cm2
14755	63.7	76.4	70.0	12.9	71.5	69.4	70.5	2.1	100	14 mg/cm2
14756	69.3	74.7	72.0	5.3	88.3	69.3	78.8	17.0	100	21 mg/cm2
14757	63.8	68.3	66.1	4.8	69.8	67.1	68.4	2.7	100	48 mg/cm2
14758	58.7	66.9	62.8	9.3	62.0	63.9	62.9	2.1	100	84 mg/cm2
14759	50.6	53.8	52.2	4.3	56.1	54.9	55.5	1.6	100	233 mg/cm2

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B2	Behind house 24	44.0	115.0	110.0	Clear; Cor w/3

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14780	0.0	0.0	0.0	17.8	117.8	117.6	117.7	.1	1	14 mg/cm2
14781	60.6	53.1	56.9	9.4	111.2	108.9	110.0	1.4	1	21 mg/cm2
14782	58.2	82.7	70.4	24.6	99.1	96.4	97.8	2.0	1	48 mg/cm2
14783	70.3	49.2	59.7	24.9	89.9	89.3	89.6	.5	1	84 mg/cm2
14784	45.7	59.1	52.4	18.1	60.1	61.8	61.0	1.9	1	233 mg/cm2
14775	70.7	78.6	74.7	7.5	73.5	76.3	74.9	2.6	50	14 mg/cm2
14776	69.4	72.8	71.1	3.3	71.0	72.9	72.0	1.8	50	21 mg/cm2
14777	66.4	63.3	64.9	3.4	70.1	68.4	69.3	1.7	50	48 mg/cm2
14778	59.6	62.3	61.0	3.1	59.8	60.4	60.1	.6	50	84 mg/cm2
14779	40.1	43.8	42.0	6.3	49.5	47.5	48.5	3.0	50	233 mg/cm2
14770	54.8	69.0	61.9	16.3	65.0	65.3	65.2	.3	100	14 mg/cm2
14771				No Data					100	On Ground
14772	52.6	44.2	48.4	12.3	63.5	62.1	62.8	1.6	100	48 mg/cm2
14773	56.2	66.4	61.3	11.8	59.7	58.0	58.9	2.1	100	84 mg/cm2
14774	41.4	50.4	45.9	13.8	49.7	51.3	50.5	2.3	100	233 mg/cm2

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B3	Leach field road	38.0	100.0	80.0	Clear; Cor w/35

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14795	77.4	89.4	83.4	10.1	92.2	93.6	92.9	1.1	1	14 mg/cm2
14796	86.1	94.1	90.1	6.3	103.5	100.2	101.8	2.3	1	21 mg/cm2
14797	87.5	92.2	89.8	3.7	110.0	125.6	117.8	9.4	1	48 mg/cm2
14798	70.3	85.4	77.8	13.6	92.0	101.5	96.7	6.9	1	84 mg/cm2
14799	47.4	54.1	50.7	9.4	56.2	56.7	56.5	.6	1	233 mg/cm2
14790	57.3	69.9	63.6	14.0	68.1	66.5	67.3	1.6	50	14 mg/cm2
14791	64.2	69.2	66.7	5.4	66.9	64.3	65.6	2.8	50	21 mg/cm2
14792	61.7	67.9	64.8	6.8	61.6	60.7	61.2	1.0	50	48 mg/cm2
14793	66.1	59.2	62.6	7.7	60.3	58.8	59.6	1.8	50	84 mg/cm2
14794	45.9	48.2	47.0	3.5	47.5	48.0	47.7	.7	50	233 mg/cm2
14785	51.6	58.0	54.8	8.2	57.6	58.1	57.9	.6	100	14 mg/cm2
14786	57.6	65.3	61.4	8.8	59.5	58.4	58.9	1.4	100	21 mg/cm2
14787	53.0	59.3	56.1	7.9	55.9	55.3	55.6	.8	100	48 mg/cm2
14788	50.9	57.5	54.2	8.5	52.9	53.0	53.0	.2	100	84 mg/cm2
14789	44.7	46.1	45.4	2.2	46.3	45.9	46.1	.5	100	233 mg/cm2

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B4	Leach field road	35.0	90.0	80.0	Unclear; Cor w/B3, 36

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14810	53.8	17.9	35.8	70.8	64.6	65.3	65.4	1.9	1	14 mg/cm2
14811	32.9	42.0	37.5	17.2	64.8	67.5	66.2	2.9	1	21 mg/cm2
14812	33.4	32.8	33.1	1.1	56.2	57.7	56.9	1.9	1	48 mg/cm2
14813	34.0	47.0	40.5	22.8	51.1	51.9	51.5	1.1	1	84 mg/cm2
14814	30.1	34.4	32.3	9.3	40.4	39.7	40.0	1.3	1	233 mg/cm2
14805	55.2	62.6	58.9	8.9	58.4	57.4	57.9	1.3	50	14 mg/cm2
14806	58.7	63.6	61.1	5.6	57.8	56.8	57.3	1.2	50	21 mg/cm2
14807	55.7	54.2	54.9	2.0	53.6	52.4	53.0	1.7	50	48 mg/cm2
14808	48.8	56.6	52.7	10.5	49.5	48.6	49.0	1.3	50	84 mg/cm2
14809	39.7	41.0	40.4	2.3	41.6	44.2	42.9	4.3	50	233 mg/cm2
14800	42.9	48.9	45.9	9.2	53.7	53.1	53.4	.9	100	14 mg/cm2
14801	46.4	53.7	50.1	10.3	51.0	49.4	50.2	2.1	100	21 mg/cm2
14802	42.0	44.2	43.1	3.5	48.2	49.5	48.8	1.9	100	48 mg/cm2
14803	40.9	45.5	43.2	7.5	46.1	46.4	46.3	.4	100	84 mg/cm2
14804	31.0	35.9	33.5	10.3	40.6	40.6	40.6	.1	100	233 mg/cm2

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B5	Excavation plot	12.5	38.0	40.0	Clear; Cor w/14

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14825	13.6	15.4	14.5	8.6	18.8	18.6	18.7	.9	1	14 mg/cm2
14826	13.8	13.2	13.5	3.4	16.8	17.3	17.1	2.3	1	21 mg/cm2
14827	11.6	12.4	12.0	5.1	15.1	16.5	15.8	6.2	1	48 mg/cm2
14828	11.2	13.2	12.2	11.3	14.4	15.7	15.0	6.2	1	84 mg/cm2
14829	8.8	10.7	9.7	13.5	13.3	14.0	13.7	3.6	1	233 mg/cm2
14820	7.8	10.8	9.3	23.0	16.0	16.2	16.1	1.1	50	14 mg/cm2
14821	12.4	13.8	13.1	7.5	15.6	16.2	15.9	2.5	50	21 mg/cm2
14822	11.9	12.0	12.0	.5	15.7	16.2	16.0	2.2	50	48 mg/cm2
14823	12.6	11.8	12.2	4.3	15.0	15.6	15.3	2.8	50	84 mg/cm2
14824	8.3	11.4	9.9	21.9	14.2	14.7	14.4	2.3	50	233 mg/cm2
14815	9.4	10.8	10.1	9.6	15.5	16.4	16.0	4.0	100	14 mg/cm2
14816	9.6	12.7	11.1	19.9	16.2	17.0	16.6	3.5	100	21 mg/cm2
14817	9.0	9.2	9.1	1.7	15.1	15.0	15.0	.6	100	48 mg/cm2
14818	11.1	12.5	11.8	8.4	15.5	16.5	16.0	4.7	100	84 mg/cm2
14819	12.3	11.3	11.8	5.9	14.6	15.7	15.2	5.3	100	233 mg/cm2

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B6	Tree E135	12.5	22.0	20.0	Clear-unclear Cor w/61, B7

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14840	16.2	19.6	17.9	13.3	22.7	23.2	22.9	1.6	1	14 mg/cm2
14841	15.4	19.7	17.6	17.3	21.5	22.0	21.8	1.8	1	21 mg/cm2
14842	12.4	12.1	12.2	1.3	18.7	18.7	18.7	.0	1	48 mg/cm2
14843	0.0	10.7	5.4	141.4	15.8	16.0	15.9	.6	1	84 mg/cm2
14844	0.0	0.0	0.0	0.0	10.3	10.2	10.2	.6	1	233 mg/cm2
14835	15.0	18.6	16.8	15.3	15.6	15.8	15.7	.9	50	14 mg/cm2
14836	16.6	16.0	16.3	3.0	14.6	15.9	15.3	5.9	50	21 mg/cm2
14837	14.4	17.7	16.0	14.6	14.8	15.2	15.0	2.1	50	48 mg/cm2
14838	13.9	15.6	14.7	8.2	13.8	14.4	14.1	3.3	50	84 mg/cm2
14839	12.4	12.2	12.3	1.6	11.0	11.8	11.4	5.2	50	233 mg/cm2
14830	14.1	14.9	14.5	3.9	13.4	14.1	13.7	3.9	100	14 mg/cm2
14831	14.5	15.5	15.0	4.8	13.2	14.0	13.6	4.1	100	21 mg/cm2
14832	13.9	14.3	14.1	2.0	12.6	13.6	13.1	5.5	100	48 mg/cm2
14833	12.5	15.1	13.8	13.7	12.3	13.3	12.8	5.9	100	84 mg/cm2
14834	11.5	15.0	13.2	18.3	11.4	11.9	11.6	3.6	100	233 mg/cm2

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B7	Tree E135	12.5	22.0	26.0	Unclear, Cor w/62, B6

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14855	0.0	0.0	0.0	0.0	36.6	36.5	36.6	.2	1	14 mg/cm2
14856	9.6	18.6	14.1	45.0	33.2	32.6	32.9	1.4	1	21 mg/cm2
14857	11.3	23.1	17.2	48.6	29.3	28.7	29.0	1.5	1	48 mg/cm2
14858	24.0	16.1	20.0	28.0	24.4	27.1	25.8	7.3	1	84 mg/cm2
14859	13.6	11.9	12.8	9.6	18.9	19.3	19.1	1.5	1	233 mg/cm2
14850	21.7	24.7	23.2	9.0	23.7	24.0	23.8	1.0	50	14 mg/cm2
14851	18.6	20.3	19.5	6.4	21.3	21.7	21.5	1.3	50	21 mg/cm2
14852	19.0	20.5	19.7	5.5	19.1	19.6	19.3	1.8	50	48 mg/cm2
14853	18.2	22.7	20.4	15.5	17.8	22.7	20.3	17.0	50	84 mg/cm2
14854	16.3	18.0	17.1	6.8	14.7	14.5	14.6	1.0	50	233 mg/cm2
14845	15.8	19.3	17.6	14.0	17.4	17.4	17.4	.0	100	14 mg/cm2
14846	14.7	18.6	16.6	16.4	16.3	17.4	16.8	4.5	100	21 mg/cm2
14847	16.4	17.2	16.8	3.4	15.1	15.7	15.4	3.0	100	48 mg/cm2
14848	13.9	16.2	15.0	10.7	14.8	15.3	15.1	2.1	100	84 mg/cm2
14849	15.6	15.8	15.7	.7	13.4	13.8	13.6	1.8	100	233 mg/cm2

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B8	Tree E168	5.5	4.5	3.0	Unclear; Cor w/8

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14870	7.4	8.7	8.1	11.3	5.5	5.8	5.7	3.7	1	14 mg/cm2
14871	7.3	8.5	7.9	11.1	5.2	5.8	5.5	7.6	1	21 mg/cm2
14872	8.0	7.5	7.7	4.4	5.1	5.4	5.2	4.4	1	48 mg/cm2
14873	6.5	7.4	6.9	9.5	4.7	5.3	5.0	7.9	1	84 mg/cm2
14874	8.8	8.8	8.8	.1	4.5	5.1	4.8	8.2	1	233 mg/cm2
14865	8.4	7.2	7.8	10.9	4.8	5.2	5.0	4.2	50	14 mg/cm2
14866	8.1	8.3	8.2	2.0	4.7	5.0	4.8	4.6	50	21 mg/cm2
14867	7.3	7.1	7.2	2.5	4.4	4.8	4.6	6.2	50	48 mg/cm2
14868	7.2	8.5	7.8	12.0	4.7	5.3	5.0	8.2	50	84 mg/cm2
14869	6.3	7.5	6.9	12.8	4.5	4.6	4.6	2.4	50	233 mg/cm2
14860	5.6	7.8	6.7	22.6	4.8	5.1	5.0	5.5	100	14 mg/cm2
14861	6.8	7.3	7.0	5.2	4.6	5.0	4.8	5.7	100	21 mg/cm2
14862	7.2	6.6	6.9	5.8	4.9	4.9	4.9	.6	100	48 mg/cm2
14863	6.5	6.8	6.6	3.3	4.9	4.9	4.9	.1	100	84 mg/cm2
14864	7.4	7.4	7.4	.1	4.7	4.7	4.7	.6	100	233 mg/cm2

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
B9	Tree E10	10.0	15.0	18.0	Clear-unclear Cor w/76

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
14885	15.7	16.5	16.1	3.7	20.4	20.0	20.2	1.6	1	14 mg/cm2
14886	21.5	25.5	23.5	11.9	20.6	20.5	20.6	.4	1	21 mg/cm2
14887	19.6	22.3	20.9	8.9	20.4	19.6	20.0	2.8	1	48 mg/cm2
14888	20.2	18.6	19.4	5.6	16.9	17.8	17.4	3.8	1	84 mg/cm2
14889	15.5	13.8	14.7	8.3	12.7	12.4	12.5	1.6	1	233 mg/cm2
14880	15.4	18.0	16.7	11.0	14.7	14.3	14.5	2.3	50	14 mg/cm2
14881	13.2	13.7	13.5	2.4	13.9	14.0	14.0	.7	50	21 mg/cm2
14882	15.5	16.7	16.1	5.4	13.1	12.9	13.0	1.2	50	48 mg/cm2
14883	16.6	18.4	17.5	7.5	13.1	12.8	13.0	1.6	50	84 mg/cm2
14884	14.9	17.5	16.2	11.6	10.5	11.3	10.9	5.5	50	233 mg/cm2
14875	14.3	12.7	13.5	8.4	11.8	12.0	11.9	1.4	100	14 mg/cm2
14876	11.8	14.0	12.9	12.0	12.0	12.3	12.1	1.9	100	21 mg/cm2
14877	14.2	14.6	14.4	1.9	11.1	11.5	11.3	2.3	100	48 mg/cm2
14878	12.8	13.7	13.2	4.8	11.2	11.3	11.2	.5	100	84 mg/cm2
14879	12.0	12.5	12.3	2.9	9.1	9.2	9.2	.7	100	233 mg/cm2

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
1BY	Tree B21		120.0	115.0	Cleared cor w/106

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
03520	141.2	146.2	143.7	2.4	126.1	122.5	124.3	2.1	1	14 mg/cm2
07258	120.1	132.3	126.2	6.9	113.8	115.2	114.5	.8	1	21 mg/cm2
06806	105.1	109.4	107.2	2.8	98.5	98.6	98.6	.1	1	48 mg/cm2
02963	78.6	91.2	84.9	10.5	84.8	87.0	85.9	1.8	1	84 mg/cm2
10399	55.3	63.8	59.5	10.1	63.8	66.9	65.3	3.4	1	233 mg/cm2
01330	82.6	83.9	83.2	1.1	77.4	77.7	77.6	.3	50	14 mg/cm2
17147	79.8	83.3	81.5	3.0	77.0	79.9	78.4	2.6	50	21 mg/cm2
09717	69.0	76.0	72.5	6.8	71.5	74.8	73.2	3.1	50	48 mg/cm2
06778	60.7	70.4	65.5	10.5	68.5	71.0	69.8	2.5	50	84 mg/cm2
09281	49.2	53.3	51.3	5.6	55.2	58.6	56.9	4.2	50	233 mg/cm2
01994	65.3	66.4	65.9	1.3	69.7	70.7	70.2	1.0	100	14 mg/cm2
08497	62.7	68.8	65.7	6.5	69.3	70.7	70.0	1.4	100	21 mg/cm2
12850	59.0	60.0	59.5	1.2	65.6	67.5	66.6	2.1	100	48 mg/cm2
00729	62.3	64.5	63.4	2.4	62.4	65.5	63.9	3.4	100	84 mg/cm2
03796	52.4	56.2	54.3	4.9	53.0	54.4	53.7	1.8	100	233 mg/cm2

Table A2. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value. PIC and μR readings ("μR/hr") were taken 100 cm from the ground.

Site	Location	PIC	μR meter May 85	μR meter Nov 85	Site comment
1BZ	Tree B21		100.0	95.0	Crushed Coral Cor w/107

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)	Comment
13046	23.6	24.5	24.1	2.5	30.3	31.6	30.9	3.1	1	14 mg/cm2
17118	27.5	27.5	27.5	.1	31.0	31.1	31.0	.4	1	21 mg/cm2
00845	26.0	27.4	26.7	3.8	30.4	31.1	30.7	1.7	1	48 mg/cm2
00395	26.9	25.3	26.1	4.4	28.5	28.7	28.6	.7	1	84 mg/cm2
15159	24.6	27.1	25.9	6.7	28.5	29.0	28.8	1.4	1	233 mg/cm2
04124	32.5	32.1	32.3	.8	46.1	47.0	46.6	1.4	50	14 mg/cm2
06760	36.7	39.6	38.2	5.4	43.6	45.9	44.8	3.6	50	21 mg/cm2
04082	40.4	38.5	39.4	3.4	41.9	43.1	42.5	2.0	50	48 mg/cm2
07558	41.5	40.4	40.9	2.0	42.7	44.5	43.6	3.0	50	84 mg/cm2
02862	36.3	37.0	36.6	1.3	38.8	41.4	40.1	4.5	50	233 mg/cm2
09074	45.1	49.8	47.4	7.0	53.8	55.7	54.8	2.6	100	14 mg/cm2
07459	50.8	52.7	51.7	2.6	52.7	55.0	53.8	3.0	100	21 mg/cm2
15951	43.3	49.5	46.4	9.4	51.6	54.0	52.8	3.2	100	48 mg/cm2
17308	39.4	41.5	40.5	3.8	50.0	50.7	50.4	1.0	100	84 mg/cm2
03334	47.0	48.4	47.7	2.1	45.8	47.3	46.5	2.3	100	233 mg/cm2

Appendix A: Raw Data

Table A3: *In Situ* Fade Study

Table A3. Raw data. Units are TLD response/hr, approximating μR/hr, and the 95% confidence interval includes ±15% of the reported value.

Site	Location	Site Comment
F1	Inside house 22	No direct sun

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)
14894	153.6	168.9	161.3	6.7	149.[illegible]	143.1	146.1	2.9	100
14895	157.9	161.4	159.7	1.5	147.[illegible]	149.2	148.5	.6	100

Site	Location	Site comment
F2	Side house 22	Breezy, semi-shade

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm))
14890	144.3	169.8	157.0	11.5	144.[illegible]	144.8	144.5	.3	100
14891	139.3	138.3	138.8	.5	150.[illegible]	147.7	149.3	1.5	100

Site	Location	Site Comment
F3	Bunker	Sunny and hot

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)
14892	154.1	173.1	163.6	8.2	156.[illegible]	151.8	153.9	1.9	100
14893	132.2	146.7	139.5	7.3	160.[illegible]	153.1	156.6	3.2	100

Site	Location	Site comment
1F4	In house 22	No direct sunlight

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm))
00873	157.5	182.9	170.2	10.5	149.[illegible]	156.8	153.1	3.4	100
13025	147.6	166.7	157.1	8.6	154.[illegible]	156.8	155.7	1.1	100

Site	Location	Site Comment
1F5	Behind house 22	Breezy, semi-shade

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)
13257	141.5	165.3	153.4	11.0	155.[illegible]	158.4	157.0	1.3	100
09384	169.3	190.8	180.1	8.4	163.2	169.1	166.2	2.5	100

Site	Location	Site comment
1F6	Bunker	Hot, direct sunlight

TLD	E1	E2	Avg E1 E2	% Std dev	E3	E4	Avg E3 E4	% Std dev	Height (cm)
06714	158.1	171.5	164.8	5.7	174.2	169.1	171.7	2.1	100
02601	169.6	189.6	179.6	7.9	170.0	167.9	169.0	.9	100

Appendix B: Dose Rates on Bikini and Eneu

Table B1. Determination of Dose Rates on Bikini and Eneu.

Notes:

(1) Beta dose rates with an associated "<" symbol were calculated using the minimum detectable beta dose, which was ±18% of the respective D(Or) dose. These beta dose rates, and the resulting shallow dose rates, have an unspecified error associated with them.

(2) Data reported in this Appendix reflect radiation dose rates in excess of the background dose rate of 3.3 μR/hr.

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β+ D(Or).

Site 1: Inside house 24; Concrete floor

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< 1.0	---	< 6.7	---	5.7	21.5%	7.8	21.5%
50	< 1.0	---	< 6.4	---	5.4	21.8%	7.5	21.8%
100	< 1.0	---	< 6.4	---	5.4	21.8%	7.5	21.8%

Site 3: Behind house 24; Clear, correlate with Site 4

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	83.4	18.2%	107.5	14.6%	24.1	16.5%	33.1	16.5%
50	43.3	26.1%	66.7	17.9%	23.3	16.6%	32.0	16.6%
100	36.6	29.3%	59.9	19.0%	23.4	16.6%	32.1	16.6%

Site 4: Behind house 24; Uncleared, correlate with Site 3

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	37.5	25.6%	56.8	17.9%	19.3	16.9%	26.5	16.9%
50	40.0	27.5%	63.4	18.4%	23.4	16.6%	32.1	16.6%
100	34.2	31.0%	57.8	19.5%	23.6	16.6%	32.4	16.6%

Site 5: Inside house 12; Concrete floor

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	12.5	21.2%	15.3	18.0%	2.8	28.1%	3.9	28.1%
50	6.6	33.0%	9.6	24.2%	3.0	27.4%	4.1	27.4%
100	5.6	38.2%	8.8	26.3%	3.1	26.8%	4.3	26.8%

Site 6: Side house 12; Coral sand, correlate with Site 7

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	14.4	24.0%	19.5	18.7%	5.1	22.4%	6.9	22.3%
50			No Data					
100	8.4	36.6%	13.9	13.7%	5.5	21.7%	7.6	21.7%

Site 7: Side house 12; Unclear, correlate with Site 6

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	36.5	22.6%	51.4	16.9%	14.9	17.5%	20.5	17.5%
50	23.9	25.7%	35.4	18.4%	11.5	18.2%	15.8	18.2%
100	17.4	32.0%	28.8	20.7%	11.4	18.3%	15.6	18.3%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β+ D(Or).

Site 8: Tree 168; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.6	---	1.3	42.9%	1.8	42.8%
50	< .1	---	< 1.0	---	.8	59.9%	1.1	59.6%
100			No Data					

Site 9: Inside House 5; Concrete floor

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	13.9	23.8%	18.6	18.7%	4.7	22.9%	6.5	22.9%
50	7.7	33.7%	11.8	23.6%	4.1	24.1%	5.6	24.1%
100	4.9	48.2%	9.0	28.5%	4.1	24.1%	5.6	24.1%

Site 10: Behind house 5; Unclear, correlate with Site 11

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	65.5	20.5%	89.5	15.7%	23.9	16.6%	32.9	16.6%
50	38.3	27.9%	61.1	18.6%	22.8	16.6%	31.3	16.6%
100	30.2	32.5%	52.3	20.1%	22.1	16.7%	30.4	16.7%

Site 11: Behind house 5; Clear, correlate with Site 10

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	34.6	22.1%	47.9	16.7%	13.4	17.8%	18.4	17.8%
50	23.9	31.1%	39.7	19.9%	15.8	17.4%	21.7	17.3%
100	23.0	30.7%	37.8	19.9%	14.8	17.5%	20.4	17.5%

Site 12: Excavation buffer; Clear-unclear, correlate with Site 13

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	65.6	18.0%	83.4	14.6%	17.9	17.1%	24.5	17.1%
50	37.1	24.5%	54.7	17.5%	17.6	17.1%	24.2	17.1%
100	26.9	31.0%	44.9	19.8%	18.0	17.1%	24.8	17.1%

Site 13: Excavation buffer: Unclear, correlate with Site 12

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	65.4	21.7%	91.9	16.1%	26.5	16.4%	36.4	16.4%
50	40.9	28.8%	66.6	18.8%	25.7	16.4%	35.3	16.4%
100	28.8	35.8%	52.9	20.9%	24.1	16.5%	33.1	16.5%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Cr).

Site 14: Excavation plot; Clear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.5	49.3%	12.9	26.9%	6.4	20.8%	8.8	20.8%
50	7.9	36.2%	12.8	23.9%	4.9	22.6%	6.7	22.6%
100	6.7	43.7%	12.2	26.0%	5.5	21.8%	7.5	21.8%

Site 15: Excavation plot; Clear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	13.9	23.4%	18.4	18.6%	4.5	23.3%	6.2	23.2%
50	6.1	43.5%	10.9	26.5%	4.8	22.8%	6.6	22.8%
100	6.9	42.7%	12.4	25.7%	5.5	21.8%	7.5	21.8%

Site 16: Excavation plot; Clear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	9.8	28.1%	13.8	21.1%	4.0	24.3%	5.5	24.2%
50	5.6	46.9%	10.4	27.4%	4.8	22.8%	6.6	22.8%
100	4.9	56.3%	10.2	29.3%	5.3	22.0%	7.3	22.0%

Site 17: Excavation buffer; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	142.2	21.8%	203.4	16.0%	61.2	15.6%	84.1	15.6%
50	60.3	30.9%	103.6	19.2%	43.4	15.9%	59.5	15.9%
100	41.2	36.4%	77.5	20.7%	36.3	16.0%	49.9	16.0%

Site 18: Excavation control; 60 cm step plot

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	8.2	40.1%	14.5	24.5%	6.3	20.9%	8.6	20.9%
50	7.0	53.6%	15.2	27.0%	8.1	19.6%	11.2	19.6%
100	8.6	55.3%	19.6	26.4%	11.0	18.4%	15.1	18.4%

Site 19: Excavation control; 30 cm step plot

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	22.6	23.9%	31.9	17.8%	9.3	19.0%	12.8	19.0%
50	20.6	29.1%	32.5	19.6%	11.9	18.1%	16.3	18.1%
100	17.6	37.9%	32.5	22.0%	15.0	17.5%	20.6	17.5%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 20: Excavation control; Control step plot

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	106.3	21.7%	151.1	16.0%	44.8	15.8%	61.5	15.8%
50	51.9	28.9%	85.4	18.7%	33.5	16.1%	46.0	16.1%
100	39.2	32.5%	68.5	19.8%	29.4	16.3%	40.3	16.3%

Site 21: Tree B10; Clear-unclear, correlate with Site 33

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	44.4	24.9%	66.6	17.5%	22.2	16.7%	30.5	16.7%
50	22.2	37.9%	41.8	21.7%	19.6	16.9%	26.9	16.9%
100	18.1	44.4%	37.5	23.2%	19.4	16.9%	26.6	16.9%

Site 22: Tree B15; Clear, correlate with Site 23

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.5	39.8%	10.9	25.6%	4.4	23.5%	6.0	23.4%
50	5.6	51.4%	11.1	28.0%	5.5	21.8%	7.6	21.7%
100	< 1.1	---	< 7.1	---	6.0	21.2%	8.3	21.1%

Site 23: Tree B15; Unclear correlate with Site 22

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	32.8	20.2%	43.0	16.0%	10.2	18.6%	14.0	18.6%
50	9.9	36.9%	17.0	23.2%	7.0	20.3%	9.7	20.3%
100	8.0	45.2%	15.3	25.4%	7.4	---	10.1	---

Site 24: Tree B8; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	57.3	16.3%	69.1	13.9%	11.8	18.2%	16.2	18.1%
50	36.8	20.2%	48.7	15.9%	11.9	18.1%	16.3	18.1%
100	23.7	26.8%	36.0	18.7%	12.2	18.0%	16.8	18.0%

Site 25: Behind house 38; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	35.6	16.7%	42.5	14.4%	6.9	20.4%	9.5	20.4%
50	21.5	20.6%	27.8	16.7%	6.3	20.9%	8.6	20.9%
100	19.2	22.2%	25.6	17.5%	6.4	20.8%	8.8	20.8%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 27: Tree 21 + 6 trees; Unclear, correlate with Site 34

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	126.9	17.9%	163.6	14.4%	36.7	16.0%	50.5	16.0%
50	56.0	28.6%	91.7	18.6%	35.7	16.0%	49.1	16.0%
100				No Data				

Site 28: Leach field road; Clear-unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	67.5	24.0%	100.5	17.0%	33.0	16.1%	45.3	16.1%
50	19.7	51.6%	45.6	24.2%	26.0	16.4%	35.6	16.4%
100	< 4.3	---	< 28.2	---	23.9	16.6%	32.8	16.6%

Site 29: Excavation control; Clear-unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	215.3	14.3%	249.1	12.5%	33.8	16.1%	46.4	16.1%
50	91.9	20.4%	126.0	15.5%	34.1	16.1%	46.9	16.1%
100	57.8	26.8%	91.1	18.0%	33.3	16.1%	45.8	16.1%

Site 30: Excavation control; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	19.8	29.2%	31.2	19.7%	11.4	18.3%	15.7	18.3%
50	13.4	36.4%	23.6	22.2%	10.2	18.7%	14.0	18.6%
100	10.6	45.4%	21.2	24.5%	10.6	18.5%	14.6	18.5%

Site 31: Tree B7 community well; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	66.6	19.4%	88.2	15.2%	21.6	16.7%	29.6	16.7%
50	29.8	31.0%	50.1	19.7%	20.3	16.8%	27.8	16.8%
100	21.6	38.2%	40.9	21.8%	19.2	16.9%	26.4	16.9%

Site 32: NPK plot; Clear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	92.6	16.6%	114.3	13.8%	21.6	16.7%	29.7	16.7%
50	52.0	22.2%	73.5	16.5%	21.5	16.7%	29.6	16.7%
100	39.0	27.0%	60.9	18.3%	22.0	16.7%	30.2	16.7%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 33: Tree B10; Unclear, correlate with Site 21

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	28.0	27.0%	43.1	18.6%	15.1	17.5%	20.7	17.5%
50	16.3	43.8%	33.2	23.2%	16.9	17.2%	23.2	17.2%
100	13.2	53.2%	30.5	25.0%	17.3	17.2%	23.8	17.1%

Site 34: Tree 21 + 6 trees; Clear-unclear, correlate with Site 27

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	119.3	19.1%	158.7	14.9%	39.4	15.9%	54.1	15.9%
50	60.5	25.3%	92.5	17.5%	32.0	16.2%	44.0	16.2%
100	35.8	36.9%	67.6	20.9%	31.8	16.2%	43.7	16.2%

Site 35: Leach field road; Clear, correlate with Site 36, B3

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	103.9	17.0%	129.8	14.0%	25.9	16.4%	35.5	16.4%
50	47.0	24.5%	70.0	17.3%	23.0	16.6%	31.6	16.6%
100	31.9	33.7%	56.6	20.3%	24.7	16.5%	34.0	16.5%

Site 36: Leach field road; Unclear, correlate with Site 35, B4

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	51.3	23.3%	74.4	16.9%	23.2	16.6%	31.8	16.6%
50	34.4	29.1%	55.8	19.0%	21.5	16.7%	29.5	16.7%
100	23.0	38.6%	43.9	21.8%	20.9	16.8%	28.7	16.8%

Site 37: Side house 32; Crushed coral gravel

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	10.0	28.4%	14.3	21.1%	4.3	23.7%	5.9	23.7%
50	5.8	49.9%	11.3	27.6%	5.5	21.7%	7.6	21.7%
100	5.6	54.8%	11.8	28.2%	6.2	21.0%	8.5	21.0%

Site 40: House 32, Lagoon side; Coral sand

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	11.8	33.0%	19.1	21.8%	7.3	20.1%	10.1	20.1%
50	10.0	36.2%	16.9	23.0%	6.9	20.4%	9.4	20.4%
100	7.6	47.8%	15.2	26.0%	7.6	19.9%	10.4	19.9%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Cr).

Site 41: Side house 5; Crushed coral gravel, correlate with Site 10, 11

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.1	42.5%	10.6	26.4%	4.5	23.2%	6.2	23.2%
50	6.3	46.0%	11.7	26.7%	5.4	21.8%	7.5	21.8%
100	5.8	53.9%	12.2	28.0%	6.3	20.9%	8.7	20.9%

Site 42: Tree E1; Clear-unclear, correlate with Site 43

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.0	29.6%	7.8	24.2%	1.8	35.4%	2.5	35.4%
50	< .4	---	< 2.5	---	2.1	32.7%	2.9	32.6%
100	< .4	---	< 2.6	---	2.2	31.9%	3.0	31.9%

Site 43: Tree E1; Unclear, correlate with Site 42

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.9	41.8%	5.8	30.3%	1.9	34.5%	2.6	34.4%
50	< .4	---	< 2.9	---	2.4	30.2%	3.4	30.2%
100	< .4	---	< 2.9	---	2.4	30.3%	3.3	30.3%

Site 44: Tree E125; Clear, correlate with Site 45

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 1.9	---	1.6	37.8%	2.2	37.7%
50	< .4	---	< 2.3	---	2.0	33.7%	2.7	33.7%
100	< .3	---	< 1.8	---	1.5	39.5%	2.1	39.4%

Site 45: Tree E125; Unclear, correlate with Site 44

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 2.2	---	1.9	34.6%	2.6	34.5%
50	< .4	---	< 2.4	---	2.0	33.6%	2.8	33.5%
100	< .6	---	< 4.2	---	3.6	25.4%	4.9	25.3%

Site 46: Tree E109; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.5	---	1.3	43.5%	1.8	43.3%
50	< .3	---	< 1.7	---	1.4	41.4%	1.9	41.3%
100	< .2	---	< 1.3	---	1.1	49.4%	1.5	49.2%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D((Or).

Site 47: Tree E111; Clear, correlate with Site 48

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .8	---	.7	70.9%	.9	70.4%
50	< .1	---	< .8	---	.7	69.7%	.9	69.3%
100	< .1	---	< .8	---	.6	72.7%	.9	72.3%

Site 48: Tree E111; Unclear, correlate with Site 47

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .7	---	.6	76.0%	.8	75.5%
50	< .1	---	< .8	---	.7	68.0%	1.0	67.6%
100	< .1	---	< 1.0	---	.8	60.2%	1.1	59.9%

Site 49: Tree E112

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .9	---	.8	64.4%	1.0	64.1%
50	< .1	---	< .5	---	.4	100.8%	.6	99.9%
100	< .1	---	< .8	---	.6	72.7%	.9	72.2%

Site 50: Tree E113; Clear-unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .4	---	.3	121.7%	.5	120.3%
50	< .1	---	< .8	---	.7	66.8%	1.0	66.4%
100	< .1	---	< .7	---	.6	79.8%	.8	79.2%

Site 51: Tree E113; Unclear, correlate with Site 50

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .7	---	.6	80.1%	.8	79.5%
50	< .1	---	< .5	---	.4	97.9%	.6	97.0%
100	< .1	---	< .5	---	.4	104.4%	.6	103.4%

Site 52: Tree E114; Clear, correlate with Site 53

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .9	---	.7	65.8%	1.0	65.5%
50	< .1	---	< .9	---	.8	63.9%	1.1	63.5%
100	< .1	---	< .9	---	.8	62.4%	1.1	62.0%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β+ D(Or

Site 53: Tree E114; Unclear, correlate with Site 52

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.3	---	1.1	47.9%	1.6	47.7%
50	< .2	---	< 1.5	---	1.3	44.5%	1.7	44.4%
100	< .2	---	< 1.1	---	.9	56.8%	1.2	56.5%

Site 54: Tree E115

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 1.8	---	1.5	39.3%	2.1	39.2%
50	< .2	---	< 1.5	---	1.3	43.8%	1.8	43.6%
100	< .2	---	< 1.6	---	1.3	42.8%	1.8	42.6%

Site 55: Tree E14; Clear, correlate with Site 56

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.1	44.4%	4.4	34.1%	1.3	44.4%	1.7	44.2%
50	< .3	---	< 1.7	---	1.5	40.1%	2.0	40.0%
100	< .3	---	< 1.7	---	1.5	40.1%	2.0	40.0%

Site 56: Tree E14; Unclear, correlate with Site 55

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.7	54.7%	4.5	36.2%	1.7	36.3%	2.4	36.2%
50	< .3	---	< 1.9	---	1.6	38.4%	2.2	38.3%
100	< .3	---	< 2.0	---	1.7	37.1%	2.3	37.0%

Site 57: Tree E141; Clear, correlate with Site 58

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.0	58.3%	2.8	44.9%	.8	60.6%	1.1	60.3%
50	< .1	---	< .9	---	.7	64.6%	1.0	64.2%
100	< .1	---	< .8	---	.7	70.5%	.9	70.1%

Site 58: Tree E141; Unclear, correlate with Site 57

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.3	36.1%	3.9	32.9%	.6	78.6%	.8	78.0%
50	< .1	---	< .9	---	.7	65.8%	1.0	65.4%
100	< .1	---	< .9	---	.8	64.5%	1.0	64.1%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 59: Tree E15; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	5.2	29.7%	6.5	25.4%	1.3	44.4%	1.7	44.2%
50	< .3	---	< 1.8	---	1.5	40.1%	2.0	40.0%
100	< .3	---	< 1.8	---	1.5	39.1%	2.1	39.0%

Site 60: Tree E119; Clear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .9	---	.8	63.0%	1.1	62.7%
50	< .2	---	< 1.2	---	1.0	53.1%	1.3	52.9%
100	< .2	---	< 1.4	---	1.2	46.3%	1.6	46.1%

Site 61: Tree E135; Clear-unclear, correlate with Site 62, B6

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1			No Data					
50	< 1.7	---	< 11.2	---	9.5	18.9%	13.1	18.9%
100	< 1.5	---	< 10.1	---	8.5	19.4%	11.7	19.4%

Site 62: Tree E135; Unclear correlate with Site 61, B7

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< 1.8	---	< 11.6	---	9.8	18.8%	13.5	18.8%
50	< 1.8	---	< 11.8	---	10.0	18.7%	13.7	18.7%
100	< 1.7	---	< 11.0	---	9.3	19.0%	12.8	19.0%

Site 63: Tree E169; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 2.0	---	1.7	37.4%	2.3	37.3%
50	< .1	---	< .9	---	.8	62.0%	1.1	61.6%
100	< .3	---	< 1.7	---	1.5	40.5%	2.0	40.4%

Site 64: Tree E12; Clear, correlate with Site 65

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.8	43.9%	3.6	36.6%	.8	60.6%	1.1	60.2%
50	< .2	---	< 1.2	---	1.0	51.7%	1.4	51.4%
100	< .2	---	< 1.3	---	1.1	49.3%	1.5	49.1%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 65: Tree E12; Unclear, correlate with Site 64

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .1	---	< .8	---	.7	70.3%	.9	69.8%
50	< .2	---	< 1.1	---	.9	56.5%	1.2	56.3%
100				No Data				

Site 66: Tree E5; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.3	47.0%	5.1	33.0%	1.8	35.8%	2.5	35.7%
50	< .4	---	< 2.5	---	2.1	32.8%	2.9	32.7%
100	< .4	---	< 2.6	---	2.2	32.0%	3.0	31.9%

Site 67: Tree E181; Clear, correlate with Site 68

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.8	53.5%	4.4	36.2%	1.7	37.4%	2.3	37.3%
50	< .3	---	< 1.9	---	1.6	38.6%	2.2	38.5%
100	< .3	---	< 2.1	---	1.8	35.9%	2.5	35.8%

Site 68: Tree E181; Unclear, correlate with Site 67

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.3	47.4%	5.2	32.9%	1.9	34.9%	2.6	34.9%
50	2.6	47.6%	3.6	37.5%	1.0	53.1%	1.3	52.8%
100	< .3	---	< 1.7	---	1.4	40.8%	2.0	40.7%

Site 69: Tree E186; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.1	---	1.0	53.3%	1.3	53.1%
50	< .1	---	< .8	---	.6	72.8%	.9	72.4%
100	< .1	---	< .9	---	.8	62.9%	1.1	62.5%

Site 70: Tree E54; Clear, correlate with Site 71

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.7	31.1%	9.3	23.8%	2.6	29.2%	3.6	29.1%
50	3.0	59.1%	5.6	34.5%	2.6	29.3%	3.6	29.2%
100	< .4	---	< 2.8	---	2.4	30.8%	3.2	30.8%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or)

Site 71: Tree E54; Unclear, correlate with Site 70

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	4.3	43.1%	6.8	29.3%	2.5	29.6%	3.5	29.6%
50	3.0	56.8%	5.3	34.7%	2.3	31.0%	3.2	30.9%
100	< .4	---	< 2.9	---	2.5	30.1%	3.4	30.1%

Site 72: Tree E37; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.5	---	1.3	43.8%	1.8	43.6%
50	< .2	---	< 1.4	---	1.2	45.9%	1.7	45.7%
100	< .3	---	< 1.6	---	1.4	41.7%	1.9	41.5%

Site 73: Tree E38; Clear, correlate with Site 74

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .6	---	< 4.0	---	3.4	26.0%	4.6	26.0%
50	< .5	---	< 3.6	---	3.0	27.3%	4.2	27.3%
100	< .5	---	< 3.2	---	2.7	28.8%	3.7	28.8%

Site 74: Tree E38; Unclear, correlate with Site 73

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.2	33.4%	9.0	24.7%	2.8	28.4%	3.8	28.4%
50	< .5	---	< 3.2	---	2.7	28.6%	3.8	28.6%
100	3.2	50.4%	5.3	33.4%	2.0	33.2%	2.8	33.1%

Site 75: Tree E184; Unclear, correlate with Site 7[illegible]

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.5	32.9%	9.4	24.4%	2.9	27.9%	4.0	27.9%
50	4.4	44.5%	7.3	29.2%	2.9	28.0%	3.9	28.0%
100	< .6	---	< 3.7	---	3.1	27.0%	4.3	27.0%

Site 76: Tree E10; Clear, correlate with Site 77, [illegible]9

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	9.1	38.6%	15.8	23.8%	6.7	20.5%	9.2	20.5%
50	6.7	37.2%	10.7	25.0%	4.0	24.3%	5.5	24.3%
100	3.9	59.3%	7.9	31.5%	4.1	24.2%	5.6	24.2%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 77: Tree E10; Unclear, correlate with Site 76

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	9.5	34.3%	15.3	22.8%	5.8	21.4%	8.0	21.4%
50	6.5	41.3%	11.2	25.8%	4.7	22.9%	6.5	22.9%
100	4.8	51.6%	9.3	29.0%	4.5	23.3%	6.2	23.2%

Site 78: Tree E190; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	5.9	31.4%	8.0	24.7%	2.1	32.7%	2.9	32.7%
50	< .5	---	< 3.1	---	2.6	29.4%	3.6	29.3%
100	4.6	31.3%	5.7	27.1%	1.1	49.9%	1.5	49.7%

Site 79: Tree E174; Clear, correlate with Site 80

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.4	---	1.2	46.7%	1.6	46.5%
50	< .2	---	< 1.2	---	1.0	52.0%	1.4	51.8%
100	< .2	---	< 1.4	---	1.2	45.4%	1.7	45.3%

Site 80: Tree E174; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.5	30.7%	3.6	31.6%	.1	311.5%	.2	301.2%
50	< .2	---	< 1.3	---	1.1	48.5%	1.5	48.3%
100	< .2	---	< 1.2	---	1.0	53.1%	1.3	52.8%

Site 81: Tree E175; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.8	51.0%	4.4	35.8%	1.5	39.2%	2.1	39.1%
50	< .3	---	< 1.9	---	1.6	37.8%	2.2	37.7%
100	< .2	---	< 1.4	---	1.2	45.6%	1.7	45.4%

Site 82: Tree E178; Clear, correlate with Site 83

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 2.2	---	1.9	35.0%	2.6	34.9%
50	< .3	---	< 2.0	---	1.7	37.3%	2.3	37.2%
100	< .3	---	< 2.0	---	1.7	36.4%	2.4	36.3%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 83: Tree E178; Unclear, correlate with Site 82

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	2.5	58.1%	4.0	38.4%	1.6	38.5%	2.2	38.4%
50	< .3	---	< 2.0	---	1.7	36.7%	2.4	36.6%
100	< .3	---	< 2.2	---	1.9	34.7%	2.6	34.6%

Site 84: Tree E34; Unclear, correlate with Site 85

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	4.1	37.8%	5.7	29.3%	1.6	38.3%	2.2	38.2%
50	< .3	---	< 2.0	---	1.7	37.3%	2.3	37.2%
100				No Data				

Site 85: Tree E34; Unclear, correlate with Site 84

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	3.3	53.2%	5.7	33.3%	2.4	30.5%	3.3	30.4%
50	< .3	---	< 1.9	---	1.6	37.6%	2.3	37.5%
100	< .3	---	< 1.9	---	1.6	38.7%	2.2	38.6%

Site 87: Tree E23; Clear-unclear, correlate with Site 8

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	10.3	25.3%	13.7	20.1%	3.4	25.9%	4.7	25.9%
50	4.1	51.1%	7.5	30.3%	3.4	25.9%	4.7	25.9%
100	< .6	---	4.2	---	3.5	25.5%	4.9	25.5%

Site 88: Tree E23; Unclear, correlate with Site 87

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	8.1	33.7%	12.5	23.3%	4.4	23.4%	6.1	23.4%
50	< .7	---	< 4.6	---	3.9	24.5%	5.4	24.5%
100	< .6	---	< 4.1	---	3.5	25.6%	4.8	25.6%

Site 89: Tree E17A; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .2	---	< 1.1	---	1.0	54.1%	1.3	53.9%
50	< .2	---	< 1.3	---	1.1	49.0%	1.5	48.9%
100	< .2	---	< 1.5	---	1.2	45.3%	1.7	45.1%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 90. Tree E165; Unclear

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	< .3	---	< 1.9	---	1.6	38.4%	2.2	38.3%
50	2.5	56.1%	4.1	37.7%	1.6	38.8%	2.2	38.7%
100	< .4	---	< 2.8	---	2.4	30.6%	3.3	30.5%

Site 100: Tree B3; Uncleared, correlate with Site 1[illegible]1

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	143.7	17.9%	185.4	14.3%	41.7	15.9%	57.2	15.9%
50	74.2	24.0%	110.7	16.9%	36.4	16.0%	50.0	16.0%
100	40.2	37.8%	77.4	21.1%	37.3	16.0%	51.2	16.0%

Site 101: Tree B4; Cleared, correlate with Site 102

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	97.1	19.4%	129.9	15.1%	32.8	16.1%	45.1	16.1%
50	41.5	33.2%	73.8	20.0%	32.3	16.2%	44.3	16.2%
100	35.9	33.4%	63.8	20.1%	27.8	16.3%	38.2	16.3%

Site 102: Tree B4; Uncleared, correlate with Site 10[illegible]

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	47.3	32.1%	82.7	19.6%	35.3	16.1%	48.5	16.1%
50	35.0	39.8%	69.4	21.6%	34.4	16.1%	47.3	16.1%
100	28.4	40.8%	56.8	22.0%	28.4	16.3%	39.0	16.3%

Site 103: End of Isle; Uncleared

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	6.7	48.3%	13.3	26.6%	6.5	20.7%	9.0	20.7%
50	5.6	51.6%	11.1	28.0%	5.5	21.7%	7.6	21.7%
100	< 1.2	---	< 8.1	20.4%	6.9	20.4%	9.4	20.4%

Site 104: Behind house 32; Cleared, correlate with Site 37

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	20.0	21.2%	26.0	17.0%	6.0	21.2%	8.2	21.2%
50	12.7	28.5%	18.9	20.4%	6.1	21.1%	8.4	21.0%
100	7.4	51.7%	15.6	26.6%	8.2	19.5%	11.3	19.5%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 105: Tree B21; Unclear, correlate with Site 106, 107

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	115.8	19.4%	155.1	15.0%	39.3	15.9%	54.0	15.9%
50	70.0	26.0%	109.0	17.6%	39.0	16.0%	53.6	16.0%
100	39.5	38.5%	76.9	21.2%	37.5	16.0%	51.5	16.0%

Site 106: Tree B21; Clear, correlate with Site 105, 107, B10

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	45.7	32.9%	80.9	19.8%	35.3	16.1%	48.4	16.1%
50	45.6	29.2%	75.1	18.8%	29.5	16.3%	40.5	16.3%
100	33.0	38.2%	63.6	21.3%	30.6	16.2%	42.1	16.2%

Site 107: Tree B21; Crushed coral gravel, correlate with Site 105, 106

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	12.5	48.3%	26.6	24.5%	14.2	17.6%	19.5	17.6%
50	18.5	46.6%	39.6	23.5%	21.1	16.8%	29.0	16.8%
100	19.9	49.2%	44.7	23.8%	24.8	16.5%	34.0	16.5%

Site 108: Tree B10; Unclear, correlate with Site 109, 110

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	39.6	33.0%	69.9	2---	30.3	16.2%	41.6	16.2%
50	19.7	46.2%	42.3	23.3%	22.5	16.7%	31.0	16.6%
100	17.6	49.1%	39.1	23.9%	21.5	16.7%	29.5	16.7%

Site 109: Tree B10; Crushed coral gravel, correlate with Site 108, 110

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	9.0	50.6%	19.2	25.7%	10.2	18.6%	14.0	18.6%
50	< 3.2	---	< 20.8	---	17.6	17.1%	24.2	17.1%
100	< 3.3	---	< 21.6	---	18.3	17.0%	25.1	17.0%

Site 110: Tree B10; Cleared, correlate with Site 108, 10

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	59.0	20.9%	80.9	15.9%	21.9	16.7%	30.1	16.7%
50	28.6	32.9%	49.6	20.2%	21.1	16.8%	28.9	16.8%
100	23.5	36.2%	43.0	21.2%	19.5	16.9%	26.8	16.9%

Table B1. Determination of dose rates on Bikini and Eneu. Dose rates are background subtracted and are reported in μrem/hr at the 95% confidence level. Deep dose rates are reported as organ doses (D(Or)), and at a depth of 1 gm/cm^2 (D(1cm)). Beta (β) dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Site 111: Tree B3; Cleared, correlate with Site 100

Height (cm)	β	+/-	Sh	+/-	D(Or)	+/-	D(1cm)	+/-
1	17.4	34.2%	30.0	21.2%	12.6	18.0%	17.3	17.9%
50	15.0	46.5%	31.6	23.8%	16.6	17.2%	22.9	17.2%
100	14.0	54.2%	33.0	25.0%	19.0	17.0%	26.1	17.0%

Appendix B: Dose Rates on Bikini and Eneu

Table B2. Dose Rate Summaries in mrem/yr.

Note: In cases where the lowest shallow or beta dose rate was less than some value, the "<" symbol was ignored, and the median, mean, and low dose rates were tabulated as though the value was an absolute.

Table B2. Dose rate summary in mrem/yr. Dose rates are background subtracted and reported in mrem/yr at the 95% confidence level. Deep dose rates are reported as organ doses and at a depth of 1 gm/cm^2. Beta dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Eneu—All sites

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	90.6	19.4	23.3	< .5
Shallow	138.3	32.8	40.2	< 3.6
Deep (Organ)	86.1	13.9	16.9	1.1
Deep (1 cm)	118.3	19.1	23.3	1.6

	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	58.4	2.5	8.3	< .7
Shallow	103.3	16.4	25.8	< 4.5
Deep (Organ)	87.5	13.7	17.5	3.8
Deep (1 cm)	120.3	18.9	24.1	5.3

	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	42.3	2.4	6.0	< .7
Shallow	96.2	15.8	23.8	< 4.3
Deep (Organ)	81.5	13.1	17.9	3.6
Deep (1 cm)	112.0	18.1	24.6	5.1

Bikini—All sites

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	1885.9	324.3	447.0	< 9.0
Shallow	2182.0	473.9	613.6	< 58.9
Deep (Organ)	536.1	131.3	166.8	24.8
Deep (1cm)	736.3	180.4	229.2	34.2

	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	805.0	194.7	248.1	< 8.6
Shallow	1104.1	366.3	407.5	< 56.1
Deep (Organ)	379.8	154.3	159.4	26.3
Deep (1cm)	521.6	212.0	219.0	36.1

	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	506.4	158.8	173.8	< 8.6
Shallow	798.3	315.1	326.3	< 56.3
Deep (Organ)	328.3	160.4	152.6	27.6
Deep (1cm)	450.9	220.3	209.6	37.9

Table B2. Dose rate summary in mrem/yr. Dose rates are background subtracted and reported in mrem/yr at the 95% confidence level. Deep dose rates are reported as organ doses and at a depth of 1 gm/cm^2. Beta dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Bikini—Inside houses (sites 1, 5, 9)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	121.9	109.1	80.0	< 9.0
Shallow	163.2	133.9	118.7	< 58.9
Deep (Organ)	49.9	41.2	38.7	24.8
Deep (1cm)	68.5	56.7	53.1	34.2
	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	67.5	58.0	44.7	< 8.6
Shallow	103.4	84.2	81.3	< 56.1
Deep (Organ)	47.6	35.9	36.6	26.3
Deep (1cm)	65.4	49.4	50.3	36.1
	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	49.2	43.2	33.7	< 8.6
Shallow	79.0	76.8	70.7	< 56.3
Deep (Organ)	47.7	35.8	37.0	27.6
Deep (1cm)	65.6	49.3	50.9	37.9

Bikini—Around houses (Sites 3, 4, 6, 7, 10, 11, 25, 37, 41, 104)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	730.3	307.2	301.0	53.6
Shallow	941.5	396.0	408.2	93.1
Deep (Organ)	211.3	88.8	107.2	37.3
Deep (1cm)	290.2	122.1	147.2	51.3
	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	379.7	209.4	210.0	50.6
Shallow	584.0	309.9	327.0	99.1
Deep (Organ)	204.6	100.4	116.9	47.6
Deep (1cm)	281.1	138.0	160.6	65.4
	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	320.3	160.3	164.6	49.3
Shallow	524.9	238.3	276.6	103.7
Deep (Organ)	206.6	85.7	112.1	48.3
Deep (1cm)	283.7	117.8	154.0	66.4

Table B2. Dose rate summary in mrem/yr. Dose rates are background subtracted and reported in mrem/yr at the 95% confidence level. Deep dose rates are reported as organ doses and at a depth of 1 gm/cm^2. Beta dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Bikini—General areas (Sites 21–24, 27–28, 31–36, 100–103, 105–106, 108, 110–111)

	High	Median	Mean	Low
At a height of 1 cm:				
Beta	1259.0	475.6	549.9	57.1
Shallow	1624.2	708.8	760.2	95.6
Deep (Organ)	365.1	198.6	210.3	38.5
Deep (1cm)	501.5	272.8	288.9	52.9
At a height of 50 cm:				
Beta	650.3	281.2	292.8	48.7
Shallow	969.3	436.9	486.0	97.0
Deep (Organ)	342.0	188.3	193.2	48.2
Deep (1cm)	469.8	258.7	265.4	66.3
At a height of 100 cm:				
Beta	351.9	201.3	192.2	< 9.5
Shallow	678.5	357.9	376.1	< 62.5
Deep (Organ)	328.3	183.0	183.9	53.0
Deep (1cm)	450.9	251.4	252.6	72.8

Bikini—Excavation plot (Sites 14–16)

	High	Median	Mean	Low
At a height of 1 cm:				
Beta	121.4	85.8	88.1	57.0
Shallow	160.9	121.0	131.7	113.3
Deep (Organ)	56.3	39.4	43.6	35.2
Deep (1cm)	77.3	54.2	60.0	48.4
At a height of 50 cm:				
Beta	69.2	53.9	57.5	49.3
Shallow	112.2	95.6	99.6	91.1
Deep (Organ)	43.0	41.8	42.2	41.8
Deep (1cm)	59.1	57.4	58.0	57.4
At a height of 100 cm:				
Beta	60.5	58.8	54.1	42.9
Shallow	108.4	106.8	101.6	89.7
Deep (Organ)	48.0	47.9	47.6	46.8
Deep (1cm)	65.9	65.9	65.4	64.3

Table B2. Dose rates are background subtracted and reported in mrem/yr at the 95% confidence level. Deep dose rates are reported as organ doses and at a depth of 1 gm/cm^2. Beta dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Bikini—Excavation experiment, buffer zone (Sites 12, 13, 17)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	1245.7	574.3	797.8	573.3
Shallow	1781.8	805.5	1106.0	730.6
Deep (Organ)	536.1	232.1	308.2	156.4
Deep (1cm)	736.3	318.8	423.3	214.8
	At a height of 50 cm:			
	High	**Median**	**Mean**	**Low**
Beta	527.9	358.2	403.5	324.6
Shallow	907.6	583.2	656.6	478.9
Deep (Organ)	379.8	225.0	253.0	154.3
Deep (1cm)	521.6	309.1	347.6	212.0
	At a height of 100 cm:			
	High	**Median**	**Mean**	**Low**
Beta	360.9	252.2	283.0	235.8
Shallow	679.0	463.2	512.0	393.7
Deep (Organ)	318.1	211.0	229.0	157.9
Deep (1cm)	436.9	289.8	314.5	216.9

Bikini—Excavation experiment, Control plot (Sites 28, 29, 30)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	1885.9	931.2	996.8	173.4
Shallow	2182.0	1323.6	1259.6	273.2
Deep (Organ)	392.4	296.1	262.8	99.8
Deep (1cm)	538.9	406.8	360.9	137.1
	At a height of 50 cm:			
	High	**Median**	**Mean**	**Low**
Beta	805.0	455.1	459.3	117.7
Shallow	1104.1	748.2	686.4	206.8
Deep (Organ)	299.1	293.1	227.1	89.1
Deep (1cm)	410.8	402.6	312.0	122.5
	At a height of 100 cm:			
	High	**Median**	**Mean**	**Low**
Beta	506.4	343.0	314.0	92.7
Shallow	798.3	600.3	528.2	185.9
Deep (Organ)	292.0	257.3	214.1	93.2
Deep (1cm)	401.0	353.4	294.1	128.1

Table B2. Dose rate summary in mrem/yr. Dose rates are background subtracted and reported in mrem/yr at the 95% confidence level. Deep dose rates are reported as organ doses and at a depth of 1 gm/cm^2. Beta dose rates are reported at a depth of 7 mg/cm^2. Shallow (Sh) dose rate = β + D(Or).

Bikini—Cleared areas (Sites 3, 6, 11, 21, 22, 28, 32, 34, 35, 40, 101, 104, 106, 110, 111)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	1044.8	399.9	477.4	57.1
Shallow	389.8	708.8	655.5	95.6
Deep (Organ)	345.0	192.2	178.1	38.5
Deep (1cm)	473.9	264.1	244.6	52.9
	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	529.8	229.8	267.6	48.7
Shallow	810.5	417.3	442.3	97.0
Deep (Organ)	282.7	186.6	174.7	48.2
Deep (1cm)	388.3	256.3	240.0	66.3
	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	341.4	201.3	186.7	< 9.5
Shallow	592.1	331.2	352.7	< 62.5
Deep (Organ)	278.6	171.0	166.0	48.3
Deep (1cm)	382.6	234.8	228.0	66.4

Bikini—Uncleared areas (Sites 4, 7, 10, 23–25, 27, 31, 36, 100, 102–103, 105, 108)

	At a height of 1 cm:			
	High	Median	Mean	Low
Beta	1259.0	414.6	520.4	59.1
Shallow	1624.2	612.1	717.1	116.3
Deep (Organ)	365.1	189.0	196.7	57.1
Deep (1cm)	501.5	259.6	270.2	78.5
	At a height of 50 cm:			
	High	Median	Mean	Low
Beta	650.3	301.0	298.7	48.7
Shallow	969.3	438.9	482.7	97.2
Deep (Organ)	342.0	188.1	184.0	48.5
Deep (1cm)	469.8	258.3	252.8	66.7
	At a height of 100 cm:			
	High	Median	Mean	Low
Beta	351.9	195.4	198.6	< 10.8
Shallow	678.5	350.1	368.8	70.8
Deep (Organ)	328.3	175.7	170.2	56.2
Deep (1cm)	450.9	241.3	233.8	77.3